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Editorial.

STAMPING OUT GLANDERS—THE GLASGOW EXPERIMENT.

MOST of the readers of THE VETERINARY JOURNAL have doubtless already heard of the attempt made by the Manager of the Glasgow Corporation Tramways towards the eradication of Glanders, which had shown itself in the extensive stud belonging to that Corporation. An outbreak of the disease took place in July last—the first in five years. Two horses, which were destroyed on account of severe street accidents, were found to be seriously affected, and this caused naturally great alarm in the establishment. It was therefore decided to test all the horses of the particular depôt with mallein, but before this was done a careful examination of each animal was made for the purpose of detecting any clinical symptoms that might present themselves. In none of the 734 animals was any such symptom apparent. After injection it was found that 74 animals reacted, and these were at once destroyed; on post-mortem examination it was found that 64 of these were affected with glanders in its initial stage, whilst the remaining 10 were declared to be unaffected. The same procedure took place at the other depôts of the Corporation, and similar results were obtained. As the slaughter of animals that were to all appearance quite healthy threatened to become a serious matter for the Corporation and the community, a change of tactics was adopted, and orders were given that no horses were to be slaughtered that did not show clinical signs of the disease, but 10 animals that had reacted at the last testing were isolated as suspects, and not permitted to work; in three weeks' time these 10 were tested once more, and only 4 reacted; and again, four weeks later, the test was applied, and none reacted. This result was considered so satisfactory that orders were given to test and retest the 3572 horses of the Corporation. We need not give the precise figures, but merely state that the number of reacting horses went on diminishing until at the seventh monthly test not a single animal reacted. And now a most important point comes up. One particular horse, which had reacted at the first and

the two subsequent monthly testings, and had come out clear at the next two testings, was found to be from other causes unfit for work. This horse was accordingly destroyed, and on post-mortem examination the veterinary surgeon reported that the lungs showed a number of translucent spots which may have been the lesions of glanders formerly. This seemed to indicate that the monthly testings with mallein had exerted a curative effect. The question —and it is a very important one—therefore comes to be whether the great and steady reduction of reacting cases discovered by the monthly testings with mallein was due to a curative action on the part of the mallein, or whether under the influence of the monthly testings the animals had acquired a complete immunity against the influence of the mallein just as cattle which are repeatedly tested at brief intervals with the tuberculin test are known to become proof against that diagnostic.

Our opinion is that the experiments, such as they were, do not show that the animals were really cured, but merely that the mallein had ceased to have effect. The unfortunate thing about the whole case is that the report of the experiments is written, not by the veterinary surgeon of the Corporation, nor even by a scientific man, but by the general manager of the tramways. We are not aware that this gentleman, however talented, has any qualification entitling him to speak with authority on a pathological question, and hence the report loses much of its value. Doubtless Mr. Young (the manager) had the assistance and approval of the Company's veterinary surgeon, but that is not enough. The question is a very grave one for the nation at large, and we therefore think that the Corporation ought to have taken the best professional advice and conducted their costly and important experiments only with the co-operation and in presence of acknowledged experts. We wonder what the general manager would have said if the veterinary surgeon of the tramways had proposed to revise the Corporation's tramway balance-sheet, and suggest improvements in the keeping of accounts; and yet the one act would have been on a par with the other.

In order to prove that the disease had been really removed, it would have been necessary to inoculate healthy animals—say guinea-pigs—with nodules from the animals experimented on, but there is no mention of such a course having been taken. Again, we hear of no control experiments; this was a serious mistake, because it might thus have been shown that the cure was spontaneous and due to natural causes, and that it might have taken place even had there been no administration of mallein. Besides, there is no certainty that a cure has been effected after all the trouble and expense of the experiments. M. Nocard sums up the results of careful investigations made by himself on horses in the following manner:—"Glanders may recur; a first infection that has been cured not only confers no immunity, it does not

even increase the natural resistance of the organism of the horse to the glanders bacillus or its toxines."

This is a matter which the Board of Agriculture might take up with great profit to the nation. Had the Glasgow Corporation made the proposal to the Board to conduct the experiments under the Board's supervision, and had the consequent report been drawn up by a scientific expert, there might have been a substantial advantage gained to the nation. As it is, the results are of comparatively little value.

Original Papers.

MILK FEVER.[1]

BY W. O. ROBERTSON, ESQ., M.R.C.V.S., SELKIRK.

In all deep-milking breeds of cows, milk fever annually provides its share of cases to the cattle practitioner, more so in a year like the present, when roots are scarce and much dry artificial feeding is resorted to. The cases are more numerous and severe, especially on high-class farms where the cows are kept in a plethoric condition, and form what we may call milking machines. In hilly districts, where the cows in the winter are fed on natural hay or straw and the few turnips that can be spared to them, and are then turned out to a poor pasture in the spring, milk fever is a disease that seldom occurs, and favours the idea that it is a disease of domestication combined with the milking qualities of the cow. In my opinion it does not matter much what breed the cow is, if she is a heavy milker, as milk fever is only seen in large milkers. When I see an animal with a fine head, long neck, wedge-shape body, a little hollow over the kidneys, plenty of room for a capacious stomach, deep broad ribs, large mammary gland, well set forward, with good-sized teats, and large swirling blood-vessels and lymphatics over the udder and along the sides of the abdominal wall, then I think I have come across the cow that will fill the pail and be a likely subject for milk fever. It may be her third calving, but most likely after the third.

Symptoms.—Generally from twelve to forty-eight hours after calving the cow goes down. It may be before that time. Sometimes it comes on before calving, which is said to be a dangerous form, but I have seen cases where the cow was down before calving, and after removing the calf the cow got up and did well. I think the sooner the cow goes down after calving the more dangerous it is, and if after the two days, I consider they are easier got up.

In the comatose type the first symptoms to a careful observer are a disinclination to eat, the animal becomes restless, will take some fodder into its mouth carelessly and partially chew it, and perhaps let it fall out again. If the udder is examined, it is found that the secretion of milk is partly checked, as it is very seldom a cow goes down with a full udder; rumination is checked, the animal begins to paddle with the fore feet, and shift from one hind foot on to the other. There is twitching and trem-

[1] Read before the Scottish Metropolitan Veterinary Medical Society, February 28, 1900.

bling of the muscles of the hind quarters, with straightened hocks, and knuckling of the fetlocks. There is an unsteadiness in moving, and the body makes a jerk to one side. After a few unsuccessful attempts to stand, the animal goes down, unable to maintain its balance any longer. It may rise and fall again, but as a rule remains in the recumbent position. The eyes are staring and glassy, the conjunctival vessels injected, the pupils are usually dilated, cornea insensible to the touch, the eyelids droop, there are severe clonic spasms of certain groups of muscles, the neck takes on a curved appearance, and the head is turned round to the animal's side in the well-known characteristic fashion. The animal has become comatose, or, as the attendant will remark, "fairly felled."

At the commencement of the attack, if you are called in in time, the pulse is full, and increased from 75 to 80 beats per minute, respirations increased and breathing stertorous; temperature about 102° F., which may rise a little.

We have occasionally grinding of the teeth, with a flow of tears and increase of the secretion of saliva. After a little you have a weakness of the pulse, respirations become much quieter, and the temperature falls often below 100° F. The mouth sometimes feels quite cold to the touch, and there is great difficulty in swallowing. A little later there is gastro-intestinal paralysis, with consequent constipation and tympanites, and the urine is retained. The animal lies on its side, with its legs, which have become cold, stretched out.

In the spasmodic type of milk fever we have a different train of symptoms, which very often come on early after calving. The animal is greatly excited, and seems to be in great distress and suffers much pain. It has a wild fiery expression of the eye and switches the tail. I consider this type much more difficult to treat than the comatose, and one in which accidents are more likely to occur, as by the tossing about of the head the horns are liable to be broken or the neck dislocated, or if you don't get the animal quietened down with a full dose of sedative medicine, you may have passage of ingesta up the œsophagus into the trachea and lungs, or you may have severe damage to the thighs, and if in a loose box and standing, attempts to climb the walls.

In a slight attack of the spasmodic form, where there is only congestion of the brain, the animal seems in good health between the convulsions, and I remember one cow that had a second attack of the spasmodic type, which in both attacks had the habit of gnawing her own fore legs. In another case of the same type the animal got beyond the control of the attendants when they were changing her from the byre to a loose-box, got out at the door, and had a gallop till she quietened down, and I am inclined to think the run did her a lot of good. This type of milk fever does not take so long to run its course as the comatose, the cerebral congestion passing gently into cerebral apoplexy and death—as I think the congestive recover, and where you have only functional derangement, but not the apoplectic, where you have organic lesions.

In the paraplegic type, which is often recorded, most of them I think are just post-partum paralysis: the symptoms seem to begin in the lumbar region, the cow lying quite comfortable, and seems weak and not inclined to rise. The head is carried up, but the paralytic symptoms may advance along the spine towards the higher nerve centres, and the head become involved. This form occurs principally in older cows that are a

little broken down, but with good nursing, &c. it is very amenable to treatment.

The second form of so-called milk fever is nothing more nor less than septicæmia. This form is produced by cows being calved in an infected byre or shed, and the way in which infection occurs is most frequently due to places being kept in a filthy condition, such as allowing placentæ, dead calves, or any other decomposing animal material to be in or in close proximity to the buildings. When a building becomes so infected, the labour necessary for the tending of the stock disturbs and sends floating about the building the bacilli septicæmia when such exist.

As you are all aware, it is necessary for the cultivation of microbes to have a certain temperature and suitable media, and when these two conditions are provided, there is nothing simpler than to have microbes multiplied by the million, but to the detriment of the media. Now take a newly calved cow; there you have the temperature of the animal body, the most favourable for germ cultivation. Again, you have got as a medium the natural discharges consequent upon the time of parturition, and no better medium can be got, and at the same time the organs of generation are in an open and relaxed condition, ready to receive any germs that may be floating about. Consequently the result is septicæmia.

In a paper read at this Society some years ago by Mr. Boyd, Melrose, he fully demonstrated the importance of this form of disease by statistics gained by personal experience. Mr. Boyd showed beyond doubt that unless such infected places were perfectly cleaned and disinfected, there was no way of stamping out the disease. To prove his contentions, he found that temporary prevention could be gained by removing the cow before she calved into a healthy place, and allowing her to remain there till the generative organs had properly closed.

Symptoms.—A few hours after calving the cow begins to tremble, temperature rises, pulse irregular, animal persistently lies on one side, signs of abdominal pain, resists pressure on abdomen, and before the cow dies she gives vent to one or more loud pitiful bellows.

Treatment.—Antiseptic washing out of the uterus, such as with hydrarg. perchlor. Internally—Sodii hyposulph. and cinchona.

The great aim in this form of disease is prevention, cleansing, disinfecting, &c., both in the building and surroundings.

PATHOLOGY OF MILK FEVER.

Many theories have been brought forward, such as thrombosis, embolism of the blood-vessels, functional derangement of the sympathetic nerve, leading to congestion of brain and meningitis by mental excitement, congestion of brain leading to effusion, and by pressure suspension of the function of the vagus nerve; peculiar form of indigestion; while later writers claim for one form the absorption of toxins from the generative organs. And lastly, we are having our minds directed towards the highly developed mammary gland. The milk cells are said to lose their tone by the too sudden emptying of the gland by the hand after calving, thus causing intoxication of the blood by the elements which should have been excreted by the udder as milk. This is a very plausible theory, as we know just before and a few days after parturition the milk is yellow, rich in lactalbumen and globulin in consequence of which it coagulates on boiling into "beastening."

Microscopically it contains colostrum corpuscles, many of which are loaded with oil globules. Some of them look like leucocytes, others are like degenerating epithelial cells or bits of epithelial cells. I was taught that the epithelium that filled up the lumen of the acini has to be got rid of, and it may be very well that it is shed and degenerates, that part of the débris is washed out as colostrum corpuscles and another part carried out in leucocytes that have swallowed it, and have thereby earned the name of colostrum corpuscles. During the loading condition the cells load up with granules (probably proteids and carbohydrates) and with oil globules. How far the granules and globules are the result of metastatic changes is not precisely known. It may be that some of the granules and oil globules are taken as such from the blood. In the discharging condition there is a discharge of water, &c. from the capillaries into the lumen of the acini.

Innervation of the mammary gland.—The effects of emotion and the coincidence of the establishment of lactation with parturition suggests a nervous mechanism of which there is little known. If, as has been said, by the too sudden emptying of the udder by the hand the epithelial cells of the acini lose their tone and power of secretion, still you may have a certain amount of absorption of the elements, which at this period is so rich in albumen, into the circulation. Once in the circulation the colostrum, being more like the leucocytes than red blood corpuscles, will roll very slowly along the peripheral stream of the blood-vessels, and, having a tendency to lag, may cause stagnation of the blood in the small blood-vessels and capillaries of the brain, and by pressure of the nerve centres cause loss of consciousness, volition, and sensation, as seen in milk fever; or, as Professor Mettam explained at the meeting of the National Veterinary Association this year, the possibility of the fact of the decomposition of the albuminous colostrum, originating a poison in the udder, which is absorbed into the system and produces what we may term a general paralysis of the system, acting through both cerebro-spinal axis and cerebro-spinal nerves and the sympathetic system.

Preventive treatment.—Preventive treatment in milk fever has been too little paid attention to, as we are not generally called in till the cow is down. A few of the more careful of our clients see it is much easier to keep them up than to raise them when down. To those I advise that the cows get nothing more than keeping food a fortnight before and a few days after calving, plenty straw and water, with a very few turnips, doing away with all concentrated foods, such as meals, cakes, brewers' grains, &c. I also give an aperient a week before her time is due to calve, a good dose of treacle and common salt. I never use Epsom salts for milk cows unless I want to put them dry, as I think a cow never reaches her former standard of milk after getting a purging with salts. When the cow's time is up I give another dose, and I find with this treatment I seldom have a case of milk fever on certain farms where it used to be of frequent occurrence. I advise leaving the calving of the cow as much to nature as possible, doing away with the old style of breaking the fœtal membranes as soon as the feet are seen and allowing the waters to escape. The mother should be allowed to lick the offspring all over, as it seems to give her satisfaction, and in some cases the calf may be left with the dam for a few days. I also find it good practice not to empty the udder for a few days after calving, and in heavy milkers, where the udder is much distended, I believe in milking a little off every day before calving, as I have seen cows

perfectly distressed at this period get immediate relief by the withdrawal of some of the milk from the distended udder.

Curative treatment.—Until the pathology of milk fever is better understood, we can't hold to any hard and fast rules in the treatment of milk fever. Some practitioners have abandoned their old treatment and claim to have great success with Schmidt, of Koldings, as recorded in the *Veterinary Record*, January 1st, 1898. Schmidt believes there is an auto-intoxication takes place in the udder, the poison taking its origin from the colostral corpuscles and degenerate epithelial cells. The chief aim of his treatment is to check the formation of colostral milk, and to paralyse any existing poison. To accomplish this he relies on pot. iodide. His procedure is as follows:—The udder is stripped, washed with soap and water, and disinfected with lysol solution. 7 to 10 grammes of pot. iodide are dissolved in a litre of fresh-boiled water. When the solution has cooled down to 40° or 42° C. it is infused in equal portions into the udder at the four teats. The infusion has to be accompanied by continued massage of the udder; a little air is allowed to pass in with the injection to favour the liberation of free iodine. If the pulse is weak and syncope feared, the author injects 5 grammes of caffeine dissolved in sodium salicylate water 1 to 9. At the same time the cow is washed down, warmly clothed, and receives every two or three hours an oleaginous salt clyster in small doses. If there is no difficulty aloes is given internally. The abnormally low temperature rises after an infusion, comatose symptoms disappear in four hours. Of 50 cases, more or less severe, treated by him, 46 or 92 per cent. recovered. German, Danish, Swiss, and Austrian statistics, relating to 2400 cases treated, give an average of at least 80 per cent. recoveries under Schmidt's treatment.

I have given it a trial in a number of cases with good results, but it is very difficult to keep alongside of the good news we get from the Continent; and in the spasmodic form the first treatment I resort to is M'Connell's, and give a good dose of chloral and bromide; and if it has not much effect on the toxin, it seems to cause a contraction of the blood-vessels of the brain—anæmia and sleep. After I have got the animal quiet I have had the udder stripped, washed, disinfected, &c., and have injected the pot. iodide in much larger doses than used on the Continent. In a case of the spasmodic type which I have considered hopeless, I injected 2 ounces pot. iodide; there was natural-looking milk drawn from the udder six hours after, and the cow rose twelve hours after first going down and has done well since, not even having the least mammitis. I had one case of mammitis after the injection, which I attributed to the small, badly ventilated byre; the cow was giving normal milk for thirty-six hours after calving, the inflammation setting into the udder after that period had expired. I believe greatly in the injections of the water into the udder, and use large quantities, and have tried different medicinal agents with as good results as pot. iodide.

In milk fever I think a great deal depends on having a good attendant called in in time, good nursing, with rectal injections, and removal of the urine, which is thick and soapy, by the catheter, and the cow must be kept well bolstered up and in a comfortable position, and kept well clothed. He must be one that you can depend on to give the medicine *per orem*, as the animal is very liable to be choked. Where there is great tympany, I pierce the first stomach with the trochar and canula and introduce

medicine. The animal should be occasionally turned over, plenty cold water applied to the head, and if the cow is inclined to drink, give her plenty cold water to drink.

Discussion.

Mr. Cameron, Berwick-on-Tweed.—One of the most important aspects of milk fever is the question of prevention. He supposed there were veterinary surgeons with prescriptions for preventing it, and they would see advertisements with cures for preventing it happening. He held there was no infallible prescription for preventing milk fever, because there were various exciting causes which led to it, and although they were sometimes of a different nature, they produced the same results. The nature of food and the quality of food given immediately before and after calving had a great deal to do with it. In some cases unlimited quantities of raw turnips were given, and in some cases they had a large quantity of cake and sometimes meal. Another source of milk fever was big drinks of water, or meal and water, immediately after calving. They would drink a whole pailful so greedily that the women in charge, and even the men in charge, thought the animal had not had enough and gave it another pailful. The National Veterinary Association some years ago collected a lot of evidence upon the subject of milk fever. On that occasion some veterinary surgeons sent in reports, in which they expressed the opinion that the weather had nothing to do with milk fever. If there was one thing with regard to milk fever that he was positive about, it was that the weather *had* a great deal to do with it. When they had cows calving during such storms as prevailed in February, they might look for milk fever as a certainty. The only wonder was that farmer's wives, who ought to know something about the relaxed and exposed condition of passages, did not do more to give the animals suitable protection and covering from the cold on those occasions. He used to give them calving drinks, and left the attendants a lot of instructions as to how they were to treat the cow otherwise, but he frequently found that these instructions were not obeyed. Even now he sometimes found that people did not attend to these directions in the matter of calving drinks. In one case he found that a cow had got two pailfuls of water, and in another case there was no cover put over the cow, and a draught came in from a window, doing great injury to the animal. When there was any gas likely to be brought away, he put down a piece of gutta-percha tube into the stomach, and got some one to press upon the cow's belly and then the gas came out, and they could give the medicine with the tube in, in the same way. In many cases he found considerable benefit from giving a large dose of cream of tartar at the beginning, in order to prevent tympanites taking place. If they did not get the tympanites over quickly, it had a bad influence upon the cows. At the beginning they must overcome the bad gas, which showed that the stomach was in a bad way, and this could be done by giving sulphate of soda and treacle, and sometimes a moderate dose of diffusible stimulants. Sometimes they did not require to give any stimulants, because too much had been given before they got there. With regard to hydrate of chloral, he had one case in which he gave hydrate of chloral, but it never made the slightest difference to the cow. He had two cases the previous week, where, after giving them laxative medicine, he finished up a short time afterwards

with a dose of hydrate of chloral, but in neither of these two cases did it have any effect in putting them to sleep in the same way as it would do in a cow in its normal condition. In fact both cows, after they got the hydrate of chloral, banged up to their feet and stood a considerable time afterwards. He believed more benefit would result from injecting the uterus, because, besides there being a large amount of mucous congestion, which anybody could see for themselves; there was a large amount of mucus discharged from the vagina sometimes; and then, with the fœtus, when they took it away, they had sometimes a large amount of mucus and a large quantity of blood. In a great many cases he believed there was a large amount of constipation in the posterior portion of the bowels.

Principal WILLIAMS said the spasmodic form was a great deal more common nowadays than in his younger days; therefore there must be some change in the disease. It might be possible, if it was a congested disease, that in the comatose form the congestion attacked the brain and paralysed that organ, but that in the other form the congestion was more in the membranes of the brain and gave rise to spasms. It might be true that this congestion was due to a sudden arrestment of the secretion of the milk, and the blood used up by the fœtus for its nourishment afterwards being directed to the mammary gland and extended in the form of milk; that there was some arrestment of this secretive power of the mammary gland, and that as a consequence a large amount of fluid which ought to be secreted in the form of milk was drawn back into the circulation, and local congestion of the brain and its membranes was the result. Even before he came to the college as a student, that was a general idea. They used to give large doses of cathartic medicine. No matter what condition the pulse was in, they generally bled pretty freely, and he had seen many cases in which the pulse improved under the bleeding. The pulse improved in tone, and it became less frequent during a given period, and he had also seen consciousness restored as the blood was flowing. Then they gave large doses of cathartic medicine, until they got what used to be called in Yorkshire "a road through them"; they generally recovered. He had seen great harm done by the administration of Epsom salts, and he believed a great many cattle died through getting Epsom salts. It was a pathological problem whether these symptoms were due to the absorption of ptomaines from the mammary gland, because it was quite a feasible theory that these septic matters might be absorbed from the uterus or from the passages. One fact which went against the theory of a specific poison being absorbed from the mammary gland was that the disease occurred exceedingly seldom before the third calving. If it was generated in the mammary gland, why was it not generated after the first or second calving instead of only after the third calving? With regard to the administration of large doses of stimulants, he entirely disagreed with his friend Mr. Cameron about there being constipation. The constipation was due simply to paralysis of the bowels. He did not believe in purgatives; these did not give the animal a chance to recover, and the sooner they recognised this the better. The disease had a varying course; some got better more quickly than others, and they had a great deal to learn yet. He approved of the idea of clearing out the uterus; he did not see that the experiment could possibly do any harm, because if there was a possibility of a ptomaine being absorbed, it was reasonable to conclude that this material might be absorbed from the womb as well as from the mammary gland.

VARIOUS PROFESSIONAL MATTERS.[1]

BY T. M. INGLIS, ESQ., M.R.C.V.S., FORFAR.

GENTLEMEN,—I beg to thank you for the honour you have conferred on me in re-electing me as President of this important Society. I feel that I cannot do justice to such an important office, and I trust you will overlook any deficiencies on my part while occupying the President's chair for another year.

Since I have become President, I have had every kindness extended to me by the members of the Society, and wish particularly to thank Mr. Moir, our popular Secretary, for the assistance he has given me. Recently I have gone over the books of the Society, and found them in a very satisfactory condition so far as the Secretary is concerned, and through the energy of Mr. Moir we are now able to have a bank account. It is a well-known fact to the most of us that the meetings of this Society could be better attended, and that something ought to be done to induce members to come forward. We have a large number of our members who neither attend our meetings nor contribute to the funds of the Society. I am confident that the majority of these gentlemen could find time to attend, and it is nothing more or less than carelessness on their part, and unless the Society's funds are supported we cannot expect to hold together. Our secretary has spent a good deal of time and money on these lax members, and has been most shamefully treated,—in many cases not even getting an answer to his letters. Under these circumstances, I for one do not see why these gentlemen should be allowed to remain on our membership roll, and now is the time to form a new one. I feel very much to see names struck off our roll, but we cannot allow this state of matters to go on any longer, and the defaulting members cannot attach blame to any other than themselves.

It is the usual custom in an address of this kind to touch on the different matters or politics of the profession, and, in order to do so, I would first of all like to say a few words regarding the veterinary surgeon and the present war. We ought to be very pleased indeed to think that the War Office puts so much reliance on veterinary science, and that they have chosen so many members of our profession to assist them during the present crisis. The veterinary surgeon must be a valuable officer, and one who saves the Department a great amount of money—not only in his attendance on the sick or injured animals, but also in the Remount Department. In this particular branch his services and advice are evidently relied upon to the fullest degree. There is no one who could possibly give this advice so ably and positively as the veterinary surgeon, as he has been trained for years—not a few months—by the most eminent of the profession to detect diseases and malformations peculiar to the lower animals. In the fitting up of the transports for horses I think the authority ought to be in the hands of the veterinary surgeon. Some time ago I noticed our respected friend Mr. Rutherford had at a dinner wisely mentioned the lack of veterinary supervision in fitting up the stalls of these transports. I am confident it would be the means of saving the lives of many valuable animals, and also of landing those which survive the journey in a condition to take the field at once. I

[1] Presidential address delivered before the Scottish Metropolitan Veterinary Medical Society, February 28th, 1900.

hope the time is not far distant when we shall receive the same attention and reliance in the inspection of meat and dairies as we have in the Army Veterinary and Remount Departments. I think, however, we are making headway in these matters, and the public is beginning to be convinced that it would be dangerous to have meat inspected by any other than a veterinary surgeon. There can be no doubt about the veterinary surgeon being the only fit and proper person to inspect carcases of animals and dairy cows. Imagine a sanitary inspector who may have been a plumber or mason inspecting a carcase and viscera of an animal. It is not consistent with common sense that he can be able to do so, as it should be done, when the health of the public is concerned. I have known of a sanitary inspector going into a public slaughter-house for the purpose of inspecting a suspicious carcase. He went into a booth where two carcases were hanging. One had been reported suspicious owing to tubercular lesions,—the other was healthy. The inspector, along with the owner, went forward to the sound carcase and pronounced it to be as stated by the killer. Whereupon the owner drew his attention to the fact that he was condemning the wrong carcase; and naturally enough the meat inspector felt very much taken down. In the burgh of Forfar, where I reside, the inspection of meat is entirely in the hands of the veterinary inspector under the Public Health Act. I have erected at my premises an inspection shed for inspecting purposes, and all suspicious animals, whether dead or alive, must be brought to me for inspection, as they are refused admission to the public abattoir. The same argument applies to the inspection of dairy cows. Imagine, again, gentlemen, the same tradesman examining a dairy cow for tuberculosis or some other disease. To sum the whole matter up, I say, keep every tradesman to his trade, and every professional man to his own particular profession. I noticed some days ago that Dr. Templeman, the medical officer of Dundee, in his annual report, recommended a thorough and systematic inspection of the dairy cows within the town by a qualified veterinary surgeon. He also remarked that the inspection was carried on at present by sanitary inspectors who had no veterinary training, and therefore could not possibly do the work. This officer is evidently a gentleman of common sense, and remarks of this kind and from such a source go a good way towards educating the public on these matters.

Gentlemen, I cannot lose this opportunity of referring to the lamented death of Professor Duguid,—a gentleman of many parts, and one who will be difficult to replace. As an examiner, I from experience can safely state that he was the student's friend. He had a style which put the student before him at his ease at once. As one of the veterinary surgeons acting for the Board of Agriculture, his advice must have been of immense value, and in all his many appointments he gave satisfaction by his careful and conscientious performance of duty. I am sure, gentlemen, that you will agree with me when I say that we, as members of the Scottish Metropolitan Veterinary Medical Society, feel that the veterinary profession has lost one of the most eminent of its members, and wish a special note to be taken in the minutes of the Society, and that our Secretary be instructed to send a letter of condolence to the deceased gentleman's relatives, this being the only means in our power of showing our appreciation of the work so nobly performed by a member of our profession.

Before concluding I would like to call your attention to the improve-

ment of that valuable and popular magazine the *Veterinary Journal.* It has been enlarged and in every way improved, and I hope that the members of our profession will take advantage, not only to subscribe, but to assist the respected editors, Principal Williams and his son, in their endeavours to improve veterinary science. I earnestly trust, then, that contributions of interesting cases or other veterinary matters will be sent them, which I have no doubt will be thankfully received. I trust you will excuse these few disjointed remarks, and I have again to thank you for re-electing me President of the Society.

INJURIES TO THE DISTAL EXTREMITIES.[1]

BY W. PERRYMAN, M.R.C.V.S.

MR. PRESIDENT AND GENTLEMEN,—The subject I have chosen is one which probably engages the attention of the town practitioner more than any other. Three-fourths of our cases have to do with disease of the extremities, the ratio being gradually increased from the shoulder downwards. I do not propose treating of all the diseases and injuries of the limbs, the subject being too vast, many diseased conditions being each of them sufficient to furnish an exhaustive paper. My object to-night is to bring before your notice the commoner injuries and their consequences as affecting the limb from the fetlock downward.

THE FETLOCK.

Injuries here generally arise from direct violence to the parts, produced by the animal itself, occurring more often on the inner side, due to the animal striking the limb with the opposite foot. It may be due to awkward gait, projecting shoe or clip, but generally to weakness and want of condition. The anterior part of the joint is most commonly injured by falling or knocking over. Lameness is evidenced by the usual symptoms of inflammation—excessive pain on pressure, heat and swelling. Pain is generally more acute when injury has taken place on the inner side, no doubt due to the proximity of the nerve.

Treatment should be directed to relieve pain. I myself prefer heat. Some practitioners I know favour cold. The former I consider more lasting and soothing to the patient, and favours effusions from the congested vessels. A plan I frequently adopt is to have a stocking made of sacking slipped over the foot and down round the fetlock, and well packed with hot bran. Frequent applications of warm water poured into the top will keep the parts in a state of fomentation for hours. Should a wound exist antiseptics should be used. If an abscess should form, due to the injury, I consider it advisable to open as soon as possible, and so avert any destruction of the skin.

I have noticed, and upon this I should particularly like to have the experience of members present, that wounds at the fetlock, especially those at the anterior part, when a large portion of tissue has been removed, are very tardy healing; frequently, instead of closing up, the wound apparently gets larger, a great granulating surface existing which has little if any tendency

[1] Read before the Central Veterinary Medical Society, February 1st, 1900.

to contract. The first case or two I saw do this rather astonished me; I could not assign a cause. I have now come to the conclusion that it is due to repeated injuries when the animal lies down. Horses with wounds at the ront of the joint should not be allowed to lie down; they are better slung.

Extensive wounds at the anterior part of the joint, rather high up, are frequently attended with a flow of synovia, due to injury of the bursa here situated. These cases are best treated with cold applications, astringents and antiseptic treatment is usually successful. True open joint of the fetlock I consider hopeless.

When speaking of antiseptic treatment, I might state now the course I generally adopt, so as to avoid repetition. I do not wish to advocate any one agent above another; most have their own particular fancy. Whatever drug is used it is imperative that we ensure thoroughness; if this be neglected the best and most costly preparation will fail to achieve the desired effect. Our nurses are generally of the roughest, and fail to comprehend the importance of cleanliness. We can all call to mind instances where we have asked the horsekeeper to wash a wound. He looks round the yard—he hasn't a sponge or clean linen—espies a dirty sack, and at once proceeds to cut a portion off to wash our wound. His hands are generally dirty. If this happens when we are present, we can infer it is common when we are away. To obviate this difficulty I always supply a bottle of strong solution of zinc chloride (Burnett's fluid), 200 gr. to fluid oz., with directions to use a certain proportion in the fomenting water. This is a most efficient antiseptic, it commends itself for cheapness and is easily dispensed. In the case of wounds to the lower part of the extremities, all the wound and surrounding skin can be made thoroughly aseptic, in addition to the attendant's hands and washing utensils coming under the same treatment. Further dressings can be used as dry applications, such as boracic acid, zinc oxide with starch, iodoform and starch, or any agent deemed desirable. I have adopted this measure for some years now, not only for wounds of the extremities, but for most on other parts of the body. I can claim several cases of healing by first intention.

Injury to the Pastern.

This can be divided into two heads: (1) injury with wound; (2) injury without wound. The former, when of the nature of simple cuts, calls for no special mention. When associated with damage to the bone more importance attaches to it. The most common form of injury is by being run over. This is generally of a serious nature. Lameness is generally acute, and the effects often very serious.

Generally when we are called to attend the patient little or no history is obtainable, the driver of the animal frequently repudiating all knowledge. If any information is forthcoming, it is often likely to involve litigation. We should be guarded as to our opinions. If it is a question of receiving compensation, I think it is our duty to point out to him the advisability of waiting until the case has advanced; many apparently small injuries through being run over leave permanent lameness, due to severe periosteal injury or fracture of the bone, ringbone being the sequel.

When first seen, a simple abrasion may only exist, or the hair giving the appearance of having been shaved off above, ending inferiorly in a wound,

the lips of the wound forming more or less of a pocket. The nearer to the coronet the wound the more serious the consequences, owing to the extremity of the bone widening and thus offering greater liability to fracture.

Treatment.—Hot applications, either as water or hot bran packed round the limb, antiseptics for the wound, followed by blisters, and turn out to grass. I think the latter very essential; although the animal may go sound, the concussion on the stones is likely to bring on lameness and ringbone. Give the animal as long a rest as possible.

Injury to the pastern without wound is generally due to severe concussion, causing longitudinal fracture. This is perhaps not so frequent in town as in the country. When we get them in London they are of the simple form, difficult to diagnose; the animal giving all the indications of suppuration of the foot, yet without any appreciable heat. In two cases I jumped at a hasty conclusion on seeing the horse come out of the stable, and sent for the farrier, feeling sure I should find pus. Closer manipulation revealed excessive tenderness over the fracture. The pastern bone produced was a case I was able to localise quickly, and as the animal was a "tubed" horse I had no difficulty in persuading the owner to kill at once, although he had himself treated the animal for a week for shoulder lameness. That was a weakness of the owner.

The horse was brought home sound; found next morning unable to put the limb to the ground.

Treatment I consider useless; in the majority of cases it is economy to have the horse slaughtered at once. I do not agree with breeding from animals that have defects due to injuries.

Treads.

Injuries to the pastern and coronet are very common; they vary from the slightest to the most severe cases we have to deal with. They are generally described as treads. Many are so, but I think more are the result of bruising of the skin by the animal knuckling over, and subsequent sloughing of the parts. No doubt in cold and snowy weather some are due to the effects of salt and snow, and in dirty weather to the unwholesome use of washing of the legs. I think some have a septic origin through small wounds on the skin. All are characterised by excessive lameness. In many cases the animal is unable to put the foot to the ground; sometimes only just the toe is used. When the limb is moved the horse generally jerks the legs upwards and backwards. A portion of skin at first appears greyish or black, the skin round the margin being very sensitive; subsequently a yellowish coagulable pus exudes, with separation round the edges of the slough. When the portion of dead skin is removed, lameness abates, and a granulating wound remains which is not difficult to treat. Should the injured parts extend to the coronary band or to the inside of the hoof, we have a difficult case to deal with; open joint might supervene and the case become hopeless; or the slough being firmly fixed inside the hoof, recourse must be had to the knife, a portion of the wall having to be removed. Every case needs to be treated on its merits. When paring at the coronet is needed, and time permits, do not trust to the farrier, as delicate cutting is here needed. They frequently use the knife roughly; it is better to do it yourself. Hot fomentations and linseed meal poultices I believe give best relief. Irritative fever is generally well marked. I think febrifuges with tr. aconite in drinking water very beneficial.

Occasionally a so-called tread progresses favourably for ten days or a fortnight, granulation taking place and the wound filling up rapidly; then suddenly the animal becomes very lame again. The wound should now be carefully examined, when a small hole can generally be found, often indicated by a mere speck of pus exuding after the wound has been washed and the patient made to walk a few yards. Cases of this class I look upon as having received fresh injury, or, owing to the vitality becoming impaired, a further portion of tissue at the most internal part of the wound has again become necrotic. Often where I have seen this happen granulation had been carried on very rapidly. I find in these cases it is the best plan to syringe the sinus with a caustic, HgCl. or ZnCl., which generally has the desired effect of removing the offending tissue, and with it the lameness.

Before leaving this part of my subject, I should like to mention a very important factor in producing treads proper. I refer to horses affected with itchy legs. Animals so affected are continually cutting the legs, in addition to the annoyance of constantly stamping and the difficulty in shoeing them. It is a curable complaint, being due to parasitic presence —symbiotes equi. I find a dressing composed of Ol. picis, Ol. ter. and sol. staphisagria when properly applied speedily puts an end to the trouble. Owners are pleased, and never begrudge paying for the abatement of the nuisance. Prevention here is better than cure.

Injuries to the Foot.

The majority of these are produced in shoeing—pricks and binds; others by picking up foreign bodies, or by treading on the shoe when it has become loose and shifted its position. A prick is when through accident or neglect the nail has pierced the sensitive foot.

A bind is when the nail has been driven too near, causing pressure on the sensitive laminæ. The latter I always consider more serious, for unless the shoe is speedily removed and the inflammatory action subdued, the sequel is generally more trouble. Suppuration is more tardy, and when it does take place is situated higher, and consequently more difficult to get at, and owing to the outpouring taking place between the horny and sensitive laminæ, a greater tendency exists to emerge from the coronet. Prick is near the base of the hoof, and by paring the foot pus is more readily released.

Treatment.—Remove the shoe, locate the injury and remove the horn; this I believe in doing freely. I have never yet seen the economy in just digging a hole, especially if pain is very acute. In the case of binds I generally pare well up on the inside of the wall, in fact try to bottom the injury. The cases we get are those which have existed some few days, and the farrier has failed to afford relief. Suppuration has taken place, and is often out at the coronet. Should this more serious condition of affairs exist, after paring as I have described, with a quittor syringe I endeavour to wash through—not often an easy matter, owing to the extreme sensitiveness of the parts. If successful, I seldom anticipate a serious quittor. I use strong zinc chloride lotion. The reason for the strong dressing is that I view the condition of many of these cases as similar to a sitfast, the structures (laminæ) are highly damaged, hyper-sensitive, and in the end the case will terminate in death. I have frequently been astonished after one or two successful dressings to find the animal free from acute

pain, evidenced by placing the foot more firmly on the ground, and less sensitive to touch. When I have my patient in this state, I have a three-quarter bar shoe put on the portion absent over the region of the injury; this facilitates the syringing, and removes all pressure from the parts; weak lotion is used.

In the most aggravated cases, and where severe swelling has taken place all round the coronet, I think further surgical treatment advisable. I have had some of the worst possible cases relieved by cutting right through the wall, or by paring the sole and bar thin, and cutting through at the bulb of the heel. If we consider that severe inflammation has taken place within a closed box, and that one of the ordinary conditions of inflammation (swelling) is prevented by the unyielding nature of the horn, any elasticity we can give must lessen pain.

I have just had a splendid recovery after cutting through the wall, the swelling of the coronet overlapped the foot all the way round, and the animal in great pain (hind leg), unable to put the foot to the ground; I feared a fatal termination. The relief given was remarkable, and the case proceeded rapidly. I find in cases of this description the horn has generally grown well over the parts by the time the original wound has healed, in fact the reproductive power in these cases, owing to the supply of blood being increased by the congestion, is more rapid than in ordinary life.

Injury to the Sole and Frog

Generally takes place through the picking up of nails, treading on loose shoe, the clip or nail penetrating the foot. In all I advocate a free use of the paring knife, hot fomentations, and poultices. In the majority of cases this treatment is sufficient to restore the animal to soundness in a few days.

Occasionally we have to deal with more serious cases where nails have penetrated deeply: I refer to injury in the region of the navicular. Whenever a nail has been picked up about midway in the commissure, I consider we ought always to advise rest, whether the animal is seriously lame or not. I have several cases on record where a nail has been pulled out of the foot and the horse has worked three or four days before acute lameness has set in. Suppuration then commences, followed in a few days by a flow of synovia, and finally a fatal result. In cases of this description one has to infer that after withdrawal of the foreign body the soft structures close over the wound, owing to friction entailed by work; inflammation is set up, sloughing of damaged tissue and often of the navicular bursa takes place. Possibly septic infection plays an important part. I have tried all manner of treatment with the same result—hot and cold applications, poultice, and dry dressing. If kept long enough suppuration and sloughing takes place all round the coronet.

Injuries due to the clip are very painful and troublesome; if near the periphery of the sole, a portion of the pedal bone may ultimately become detached. To encourage suppuration with linseed meal poultices and hot fomentation, and so hasten the removal of any slough, I think you will agree as being imperative.

Corn,

As generally met with, I do not propose treating of at any length. The usual farrier's remedy—pare and poultice—is generally sufficient.

A more serious injury to the heel (mostly inside), and to which I will apply the term "acute corn," to differentiate it from the ordinary or "chronic," will need further notice. Lameness usually comes on very suddenly, pain intense, the animal able to bear little or no weight on the limb; when he does the fetlock is "shot" (the expression of the owner or attendant inferring that the animal has had the fetlock dislocated). Little or no pus exists, and fails to make its appearance for several days. More often we get swelling and separation at the coronet, with pus there, before it makes its appearance at the bottom of the foot. This condition of the foot I view as the most frequent cause of quittor.

Cause.—Essentially carelessness either on the part of the owner who does not have the shoes removed soon enough, or the farrier failing to cut out loose flakes of horn when the animal was last shod. These become firmly wedged beneath the shoe and act as foreign bodies. On removing the shoe the foot is so sensitive that the animal cannot bear the foot lightly tapped, not even to have the horn cut out. The effect of this pressure is to cause severe bruising to the soft structures beneath, a portion becoming necrotic, and owing to its fibrous nature slow in becoming detached; when it does, often a small piece of the ala of the pedal bone comes away with it, or a portion works out a few days after. The slough is generally green.

Treatment.—Remove horn from the heel as extensively and as quickly as possible; if separation at the coronet has taken place, I take the wall as well, and so remove the tension from the injured part. I have found that nothing gives quicker relief than to plug the heel with HgCl. It has the desired effect of hastening the removal of the intending slough. When this is accomplished drainage from the bottom is secured, and consequently less damage to the coronary band. After this fomentation with weak antiseptic lotion is generally all that is required. I consider the best shoe after this trouble is the three-quarter or bar shoe.

Sandcrack.

A splitting of the horn fibres due to malnutrition and brittleness, or the result of previous injury to the coronary band. We are here called upon more often to advise how to keep the animal so affected at work and prevent his going lame, than to treat actual lameness, although they are by no means uncommon cases.

The first thing is to direct attention to the shoeing. All weight to be removed by cutting a portion of the wall away. Clips each side of the crack, and, where I can get it done, the foot bound round with tar and tape; over the whole a boot to be worn. The form of boot I think preferable is one having a broad tongue to overlap the crack, with the strap sewn across the front. Greater pressure can be brought to bear on the parts than when the strap is fixed to the two edges of the shield. I consider this a very important detail. Many wide sandcracks can be brought much closer together and the animal kept working, which without this aid are constantly falling lame.

Wood plugging I have never tried. Clamps I have found a failure. Nails driven through are a great success, but in London one seldom finds a farrier competent to do it. In the north (Lancashire) I have seen farriers quite experts at nailing sandcracks.

When lameness does exist, fomentation and poultices, and if there is

suppuration, removal of horn must be resorted to. I always endeavour to effect this at the bottom of the foot by cutting up at the toe on the inside of the wall. Some cases must be opened at the front. If any indications of an abscess exist at the coronet I have used an ordinary blister with the best possible results. Sandcrack I consider essentially a town disease, due to concussion on the stones. Those due to coronary injury grow much closer together in the country, those due to brittleness disappear.

Quittor.

A running wound at the coronet connected with a sinus, running downwards to a necrotic portion of tissue.

Causes.—Any injury to the foot causing death of structure, whether laminæ, cartilage, or bone. If precedence be given to one cause more than another, that which I have described as "acute corn" is more frequent than any other. Injuries to the coronet by brushing are a common cause, and supply us with many of the most difficult to cure; the injury is so readily repeated. Outside quittor is easier to treat, and the nearer the heel the better. Lameness is generally present, the degree being in ratio to the depth of the structures involved.

Treatment must be directed to the removal of a firmly adherent portion of diseased tissue. Many of the simpler forms of quittor can be cured, if the sinus is not too deep, by injections of HgCl. and ZnCl., plugging with mercury and arsenic, opening the sinus with the bistoury or the firing iron. Whatever means is adopted, the end is to remove dead or diseased tissue. Drainage is important; get a depending orifice. Where success has not been attended by the simpler methods by injection, recourse must be had to the knife. The removal of large portions of the foot are attended with great success, the reparative powers being remarkable. The course I adopt is to have the foot well poulticed before operating, so as to soften the horn for cutting. When the animal is cast, apply a strong tourniquet; this is absolutely imperative, otherwise the operator is unable to proceed satisfactorily owing to the quantity of blood. When tightly fixed after the first minute or two after incision, the vessels drain of their venous contents and leave the foot almost white.

Pare the horn quite thin from the coronet to the base over the region to be operated upon, insert a probe into the sinus, and with bistoury or scalpel remove a portion of the wall and laminæ. As a rule a lamina, or portion of one, firmly attached to the podophyllous structure beneath, stands out in great contrast to the others by being perfectly green. This is to be carefully removed, making sure none is left attached to the structures beneath. Generally a tract of flesh much darker in colour is seen, perhaps extending to the lateral cartilage; this I always remove, making sure I have nothing but healthy tissue left. It is frequently found the lateral cartilage is diseased, the whole or portions being of a greenish hue. I have also seen the cartilage quite detached from the pedal bone so as to be able to insert the finger beneath; in cases of this description the whole must be removed. I have found a very small searcher knife as useful as anything for this purpose. I have also had occasion to pare the pedal bone.

The last quittor I operated upon I removed all structures until the ligament of the pedal joint was exposed. The wound healed splendidly

and the foot has grown almost intact, but unfortunately the horse cannot trot sound.

When operating it is advisable to press well round the foot and watch for any small speck of pus. I have found transverse sinuses running towards the anterior part of the foot. After operation the parts are to be thoroughly washed antiseptically; in addition I dust over the wound with zinc oxide powder, and fill the wound up with antiseptic tow, firmly pressed in and bandaged over. Remove tourniquet and allow the horse to rise. Hæmorrhage at once sets in. I find it a good plan after a few minutes to apply the tourniquet again to control the hæmorrhage; clotting round the wound soon takes place and the pressure can be removed.

The after treatment consists of keeping the wound aseptic. Pressure in the form of tow pads I like, the granulations appear firmer, less spongy. If the operation is successful the animal soon loses all lameness, and the enlargement at the coronet begins to subside. This latter I consider the best sign of quittor, whatever method of treatment is being adopted. Pus should only be over the granulating surface and not flow from any one channel, and shouid be free from tinge of blood. After washing the wound and allowing the animal to walk a few yards, no further specks of pus should make their appearance. If they do so it is a bad sign; further operative interference is generally required.

The reproduction of horn in these cases is astonishing, taking into consideration the structures removed. After granulation the sides of the wound gradually grow together, causing very little breach in the horny box. Sandcrack results more often when extensive sloughing of the coronary band has been primary injury, than from surgical treatment if properly carried out.

SOME CURRENT TOPICS.[1]

BY JOSEPH ABSON, ESQ., F.R.C.V.S., SHEFFIELD.

WHERE is the material for my address? The subject of tuberculosis has been so thoroughly ventilated and thrashed out that little can be added at this stage, and I think we are all perfectly satisfied that steps should be taken by the State for its suppression. We may, perhaps, differ somewhat as to the *modus operandi*, but we are perfectly clear that sooner or later it must be accomplished.

Then there is the subject of meat inspection, and here I may find some material for my address. Who is so well trained and fitted for the position of meat inspector as a veterinary surgeon? Who else understands the diseases of animals? And if the inspector does not understand the diseases of animals, how can he understand the diseases to which the flesh is heir? In saying this I am not going to deprecate the good work done by medical officers of health and their subordinates in the past. But I do say that the position essentially belongs to the veterinary surgeon, who is specially trained and examined in meat inspection. And, further, I think such appointments should carry a substantial salary. You are perhaps aware that the Council at its meeting in October last appointed a deputation to wait on the President of the Local Government Board to press forward the

[1] Abstract of a Presidential Address delivered before the Lancashire Veterinary Medical Association, February 9th, 1900.

claims of our profession in this matter. I regret to say that the Board declined to receive the deputation. The Council at its last meeting elected a committee to take into consideration the whole subject of meat inspection as it affected the veterinary surgeon. We do not intend to let the matter drop, and I trust at some early date I may be able to report to you at one of our meetings what the recommendations of the committee are.

In the matter of meat inspection we are far behind our Continental brethren. In all the large cities of Europe the inspection of meat is in the hands of the veterinary surgeon, who is called the chief veterinary inspector. He has subordinate inspectors under him, some of whom are qualified, and many others not qualified. To those not qualified the duties of inspecting the offal and the general cleansing of the abattoirs are deputed, and in like manner I think it probable that the sanitary inspector will hold similar positions in this country under the veterinary surgeon. I see no reason why the sanitary inspector should not be well fitted to fill a subordinate position under a head veterinary inspector. It is curious to note that we are so far behind in the matter of meat inspection, because in no other country in the civilised world is there a sanitary code so complete and so precise as in England.

And so in like manner must we see that dairy cattle are inspected by the veterinary surgeon. And whilst referring to this subject I should like to say that I am absolutely opposed to the use of tuberculin by sanitary inspectors or laymen in any official capacity. The reasons must be perfectly obvious. I congratulate the Councils of Lancashire and Cheshire on the stand they have taken as to the supply of milk from non-tuberculous cows. In this they have certainly led the van. We have among us gentlemen who have been largely engaged in the testing of cattle for a considerable time for these authorities, and I venture to say their experience has been absolutely unique. They have taken up the subject with a zest that does them every credit. In passing I may here mention the announcement by Nocard of a new tuberculin, which gives a reaction despite injection of the older form.

It is not sufficient, however, to stand still and praise the few men who work, or to wait and grumble whilst local authorities appoint lay officers to do veterinary duties. We must take an active interest in the affairs of all Corporations and Councils, and see that we miss no opening for veterinary employment.

Epidemic "pink-eye," which has been recently raging in and around Manchester, has, I am told, been marked by many sudden and unexpected deaths. The cause has been cardiac thrombosis. I learn that lung complications have been the exception. On the other hand, in Liverpool, I believe, pneumonia has been quite common. Mr. Wolstenholme and others inform me that endocarditis has rarely been noticed in the fatal cases of cardiac thrombi. Why, may I ask, is the plugging of the heart so prevalent in some outbreaks and so rare in others? What is the condition of the blood and blood-vessels that conduces to the fibrinous condition of the blood, and why is it not constant in all outbreaks of pink-eye? Are we perfectly clear this plugging is *ante-mortem?* These are questions we may well ask ourselves and endeavour to elucidate. There can be little doubt that many animals succumb to this disease through the intensity of the poison generated in the system.

At the present time no assembly of British men can be held without a

reference to South Africa. We veterinary surgeons take a very special interest in the matter, because no greater mistakes have been made than in departments responsible for animals necessary to the efficiency of an army. I do not know who is to blame, but we hear from all sides that the wrong class of horse has been purchased, that the transport arrangements have been bad, and that disease has accompanied both our mules and horses. The veterinary department was so undermanned that over fifty civilian veterinary surgeons had to be found to do the work. Add to this that in South Africa there are special diseases to be faced, and that one—horse sickness—is widely prevalent every spring. The duties of our colleagues will be arduous and onerous, and I trust will be fully appreciated at the proper time.

The pathology of South African horse sickness is still obscure. It is said to be due to the generation or emanation of some poisonous principles from the earth during the night-time, but whether it is of microbic origin or not remains to be demonstrated. Personally, I entertain little doubt that it has its specific bacillus. Certain, it appears to be, that horses kept from feeding on the veldt during the night practically escape the disease. It is also much less prevalent on the high-lying lands. We may hope from the larger number of professional gentlemen employed during the present hostilities for some enlightenment as to its etiology, pathology, and treatment. I believe Professor M'Fadyean is at present engaged in a research on this disease.

Those of you who had the good fortune to be present at our last meeting will be anxious to know the result of those operations which were performed with such skill by Professor Hobday. The mare upon which oöphorectomy was performed made a rapid and good recovery. The wounds healed by first intention. This, as you know, was brought about by the great antiseptic precautions taken by the operator. These precautions certainly entailed extra labour and forethought, but they only show what may be accomplished by strict attention to antiseptic surgery. In the case of the operation on the cryptorchid, the result so far as antiseptic precautions are concerned was not quite so satisfactory, an abscess having formed in the scrotum. This was opened in due course, and recovery rapidly took place afterwards. We cannot expect to carry antiseptic surgery out in so complete a manner as in human surgery, where even the operating table and the very walls of the operating room are rendered aseptic, but we can do much more than we have hitherto done in this direction with, undoubtedly, corresponding good results.

I may, perhaps, be pardoned for bringing before your notice the subject of the transport of army horses during the present war. It has been most grievous to read of the torture many of these poor animals have undergone during their transit to South Africa in rough weather. The description given by an eye-witness of large numbers breaking loose and being thrown down violently on the deck, fracturing their legs and otherwise receiving most serious injuries, writhing in agonies, with their attendants perfectly helpless to assist them, is appalling. Now, where these sad accidents have occurred, the arrangements, be it said, have not been under the care of the army veterinary surgeon. Indeed, I believe, where the latter have had the arrangements in hand, the mortality through the breaking loose of horses has been practically *nil*. Where the work has been left to laymen disasters have occurred through insecure fastenings and weak woodwork. In com-

mon with Mr. Rutherford and Mr. Hunting, I think the profession would do well to make some overtures to the War Office on this important subject, for the nation cannot afford to lose horses which are destined to play so important a part in the present hostilities.

PROFESSIONAL PROBLEMS.[1]

BY SIDNEY VILLAR, ESQ., F.R.C.V.S.

At the present time, when the minds of all are occupied in contemplating the very serious aspect of affairs in South Africa, and many of us are in a state bordering on anxiety as to the welfare of relatives or friends who are serving their Queen and country in that distant sphere, it requires some effort to bring our thoughts to bear upon the ordinary problems of our professional life.

Let us hope that the good service now being rendered by our professional brethren in the Army Veterinary Department will be speedily followed by a more generous consideration of their just claims by the War Office and the Secretary of State for War. It is with feelings of pride we observe that civilian veterinary surgeons are in many cases leaving their homes and practices to join those detachments of brave volunteers who have offered their time and lives in the hour of their country's need. It has been estimated that upwards of seventy civilian veterinary surgeons, including the President of the R.C.V.S. and some of our well-known professors, are now actively engaged in duties appertaining to the war.

Next to our desire for an improvement in the status and conditions of service in the Army Veterinary Department, a question which perhaps the present is not an opportune time to consider, the most pressing detail of our political life is the preliminary examination of veterinary students. In 1896 the same question was to the fore, and the voice of the profession as declared in the election of Members of Council for that year was practically unanimous that the time had come when the educational test of students should be increased in severity. It was felt the examination then required by the General Medical Council was on a par with that which was needed by a student of veterinary medicine. In that year our present bye-law 52 came into existence, by which it is enacted that "students who enter the veterinary schools shall, prior to their first professional examination by the R.C.V.S., produce a certificate entitling the holder to be registered as a medical student on June 30th, 1896." It was considered that the standard of examination required at that date by the General Medical Council was a sufficient test of the educational acquirements of the veterinary surgeon.

The standard of June 30th, 1896, enforces a knowledge not only of history, geography, and mathematics, but also of two foreign languages and the first three books of Euclid; since that date the examination of medical students has increased in severity, and there are some members who would have our profession adopt the present standard of the medical, and increase the severity of our educational examination by twenty-five per cent. It is difficult to discover any reason why the examination which was selected as right and proper only four years ago should not be sufficient for our requirements now.

[1] Presidential address delivered before the Royal Counties Veterinary Medical Association, February 23d, 1900.

It has been pointed out that the preliminary medical examination of the Educational Institute of Scotland, which is the examination which many of the Scotch veterinary students undertake, is twenty-five per cent harder than the standard of 30th June 1896, and that therefore such Scotch students are unfairly treated. Means must be devised for putting all our students on an equality, and I venture to think the basis of June 30th, 1896, is the desirable standard. To pass such a standard a student must have had a liberal education; one which will enable him to hold his own in a high class of society, and one which in my opinion is adequate and sufficient for a member of our profession—at all events the subjects are such as will occupy a boy of average intelligence and good opportunities until he is sixteen years of age. If we keep our lads at school longer than this, the opportunity of articling them as pupils to a veterinary surgeon is lost, and I am one holding the old-fashioned belief that the best and most successful veterinary surgeons are those who have served an apprenticeship.

Why the teachers in our veterinary colleges should advocate the sending of students straight from school life to their colleges I have never been able to understand. The moral and social surroundings of a veterinary pupil of the present day are not usually such as exception can be taken to. During a period of pupilage a lad has opportunities of becoming adept in the dispensing and exhibition of medicines, he learns from practical experience the use of ropes and hobbles, knows how to approach a frightened colt, and even a disagreeable client. In many cases he then learns how to drive and ride, both well nigh indispensable acquirements, for I strongly believe that no man can possibly be in a postion to settle a knotty point in a dispute as to the wind of a hunter or racehorse unless he is himself a horseman, and has ridden horses in condition and out of condition, high blowers, slight whistlers, indeed, horses sound and unsound. A pupil in a country practice usually has opportunities of becoming practically acquainted with all these conditions. It is unfortunate, but unavoidable, that the long vacation of our schools should occur at that period of the year when professional work in country practices is comparatively slack. By the late summer and early autumn most colts have been operated upon, the majority of the cows in dairy herds have calved, and most hunting men and their horses are taking things very quietly. Please do not think I am complaining of the qualities of the young members of our profession. I venture to think that at no period have a more highly trained body of scientific gentlemen ever obtained their diplomas than those who are now coming from our schools, but one who has been through the troubles and trials of making a practice cannot but think that those young members who have missed opportunities of serving as pupils have to face many disadvantages. Professor Simonds, a gentleman to whom our profession owes much, used to advocate the sending of intending veterinary students as pupils to farmers instead of to practitioners, holding that under such conditions they acquired dexterity in the manipulation of and a knowledge of the requirements of all kinds of live stock. No doubt he had good grounds for such an opinion. Sir Frederick Fitzwygram, another member of our profession who has its interests keenly at heart, probably recognises the weak spot in our professional education by now limiting the annual competitive examinations for his prizes to practical as distinct from theoretical work.

Speaking of young practitioners and making practices reminds me that on several occasions since I have been on the Council gentlemen have complained to me of the hardship they suffer under in not being allowed to advertise. I have told such that the Registration Committee would probably not object to a simple announcement either in a newspaper or by circular that they commenced to practise at so-and-so, or have succeeded to the practice lately carried on by "Mr.———," indeed it is obvious that such a course is the readiest means of becoming a well-known man. As a Member of Council I cannot advocate that veterinary surgeons should advertise their medical preparations, or puff their special skill, but as a country practitioner I must admit that the use of veterinary medicines as advertised by druggists and quack medicine makers is enormously on the increase—to the detriment of our profession; where one person so advertised twenty years ago, ten such advertise now. We cannot stop them by legislative means; we cannot dilate in print upon the advantages of using such compounds as we have practically tested; all that we can do is to treat such animals as do not get better despite their dosing with quack remedies—oftentimes a very unsatisfactory position to be placed in. We get all the bad cases, the quack remedies get the credit for curing the mild ones. Has the restriction on our advertising helped to promote this position? One cannot but think so, and I would be glad to see some modification in the carrying out of the bye-law. But there is absolutely no ground for such statements as I have heard made, to the effect that Councilmen, having usually good practices or snug appointments, do no trouble about the struggles and difficulties of less happily circumstanced individuals who have to make their way in the world. We must regard this increased tendency of stock-keepers to buy quack medicines with regret, and I do not think we ought to stop at that. It would be a grand thing if veterinary surgeons could combine and agree to charge high fees when attending the stock of such persons as habitually make use of quack remedies. The R.S.P.C.A. could not perform a more humane work than stopping the indiscriminate administration of quack remedies to sick or injured animals. The sufferings of a horse with freshly broken knees, or wounds of any kind, when subjected to the application of stimulating embrocations must be very severe, and far in excess of the pain caused from working horses with slight abrasions from chafing harness.

But if we suffer from outside competition in the sale of medicines our duties are extending in other directions. We all know how immensely the practice of canine medicine and surgery has increased of late years. The recent appointment by the Public Health Department of the London County Council of a veterinary surgeon to inspect the udders of the milking cows of the metropolis is an innovation likely to be copied by other local authorities.

In relation to inspection of the udders of cows may I interpolate that in three cases of subacute mammitis I tested the cows with tuberculin, and each of the animals reacted to the test, yet the milk from the affected quarters of the udder when microscopically examined was found to contain no tubercle bacilli, and guinea-pigs inoculated with the milk did not become affected with tuberculosis. We must not, therefore, because a cow with subacute disease of the udder reacts to tuberculin, jump to the conclusion that the disease of the udder is necessarily tubercular.

Several of our Colonies, Continental countries, and many of the

American States now insist that all cattle imported to their countries shall previously pass the tuberculin test, and I think we may fairly anticipate that our Board of Agriculture must some day recognise the necessity of legislating for the control of tuberculosis in this country. With the knowledge now possessed by the veterinary profession of the pathology, clinical symptoms, and extent of the existence of this disease in our cattle, we can with confidence undertake any professional duties with regard to it that we are called upon to perform.

Allusion to the Board of Agriculture must recall to our minds the loss the profession has sustained by the death of William Duguid.

It is to be regretted that the Presidents of the Local Government Board and the Board of Agriculture declined at present to receive the deputation from the R.C.V.S., who were prepared to point out the unreasonableness of employing other persons than qualified veterinary surgeons as inspectors of meat. We are told the present system of inspection by laymen is on its trial. Should it fail—and there seems reasonable probability that it may—we shall be called upon to act, and it behoves each of us to study the subject practically and scientifically. We can be much assisted in the scientific detail by the careful perusal of articles in our professional periodicals.

We have just grounds for congratulation that our periodical literature in this and other scientific matters is so up-to-date; it also perhaps reflects credit upon our profession, which is numerically so small, that it can support one weekly, two monthly, and one quarterly periodical. Until about twenty years ago the whole of our needs were catered for by one journal, issued monthly. Our schools now, not to be behind-hand, publish periodicals devoted to the concerns and interests of college life.

It was a most important point which our much esteemed and well-informed friend Professor Williams made at a recent meeting of the Yorkshire Society. He said, "Men, and they must be qualified men, were wanted for the profession, and they could not get them. If owners of horses could not get properly qualified V.S., they must or would get some one. Quacks were cropping up all over the country; they are more numerous than they were three years ago." This from one point of view is good hearing, it shows that our profession is not overcrowded as is the case in this country in so many callings. There are good appointments continually being offered in our distant colonies to graduates of our College, and we may pretty confidently anticipate that before many years have passed there will be positions open to them in our Public Health Department. I venture to think that despite the introduction of automobile cars and light railways the outlook for our profession at the dawn of this, a new century, is a roseate one, and that we can with more confidence now than we could even a few years ago, advise any well-educated youth whose inclinations and tastes are that way inclined, that he might spend time, energy, and money in entering the veterinary profession with confidence that he can earn a very decent competence, even if he cannot accumulate a fortune thereby.

In ours as well as in other callings of life there are those who unfortunately fall by the way. Some of us are cut off in the prime of life, others at an earlier period before provision can be made for those who are left behind, and I would venture to ask any who are here who do not subscribe to either of our permanent benevolent societies, that they will at once

become annual subscribers to their funds. As a member of the Executive Committee of the Victoria Benevolent Fund I can tell you that the cases of some of the persons who apply for help are pitiable in the extreme. Not only widows and orphans, but occasionally members of our profession, rendered almost destitute by ill health or accident, ask for monetary assistance, and the £60 which that charity now spends annually might well be doubled or quadrupled. Gentlemen, it has been said charity begins at home. If we are prosperous let us think of our professional brethren and those dependent upon them who are in need and distress. I can honestly say that no time I ever spend is spent more disagreeably than when listening to letters read at the committee meetings of the V.V.B. Fund.

Clinical Papers.

STRANGULATION OF THE DUODENUM.

BY J. CONNOCHIE, ESQ., M.R.C.V.S., AYTON.

Subject.—An aged cart mare.

History.—Had had a few attacks of colic within the last two years.

Symptoms.—Ordinary colicky pains exhibited about mid-afternoon. These increased gradually in severity until 6 P.M., when a dirty, sour-smelling fluid commenced to gush from each nostril at very short intervals, and without any great effort on the part of the animal. In fact the action appeared entirely involuntary. This continued until 10 P.M., when it ceased. Gallons must have been voided during that time. After its cessation the pain became more acute, and the suffering patient succumbed early the following morning.

Post-mortem.—The stomach naturally was examined first, and found distended to an enormous extent. It contained, besides gas, a quantity of the muddy-looking fluid and the mid-day meal of oats and turnips. The mucous membrane was slightly congested towards the pyloric orifice.

As scarcely sufficient evidence was seen here to warrant such agony the intestines were next inspected, and the duodenum found to be greatly discoloured, seemingly from strangulation, as the line of demarcation between the normal and abnormal portion of bowel was very abruptly marked.

It is regretted that no description of the manner of strangulation can be given, as the intestines were removed in a rough and ready manner to allow the stomach to be reached. Both large and small intestines were comparatively empty.

Treatment.—In order to avoid increasing the bulk in the stomach, no liquid was given, but a ball twice repeated, containing opium, hyposulphite of soda, and chinosol. Fomentations were also tried for a time, but, of course, all to no purpose.

A COINCIDENCE.

BY W. R. DAVIS, ESQ., M.R.C.V.S., SWANSEA.

A GREY cart gelding, six years old, bred and owned by a quarryman, and doing pretty hard work. It had been fairly well fed, but was in poor condition, due doubtless to laborious work.

The horse after returning from its day's work was found to be shivering and blowing. It was bled, and received that night and the following day several doses of medicine from a quack. Two days afterwards I was sent for, and found the horse to be suffering from pneumonia, with a temperature of 106° F., and with very rapid pulse and respiration. Better hygienic surroundings were obtained for the patient, and a few doses of stimulant and febrifuge medicine given, and the case went on so satisfactorily that in a week the appetite returned, the pulse and temperature were nearly normal, and an early recovery was assured. Instructions were given as to limiting the food and giving little but often,—mashes, boiled oats, and hay being advised. Five days afterwards an urgent message was received to attend the horse again, which was now found to be suffering from a violent attack of colic and constipation.

On making a rectal examination a little fæces was removed, and was found to be hard, mucus-coated, and blood-stained. And now the owner called attention to a condition that had not previously been observed. At the posterior part of the sheath a swelling was seen, and on manipulating it a large piece of skin was found to be loose; and on pulling on this exit was given to a tea-cupful of fœtid pus. The parts were washed and injected with an antiseptic, and it was found that a sinus led up as far as one's finger would go through a mass of granulation tissue.

The colic and constipation were successfully treated by enemata, oil, and anti-spasmodics internally. The horse was at work in a little over a week afterwards. The issue of the case was of course very satisfactory, but during its later stages one was puzzled with the part the abscess, or rather the scirrhus cord, as it afterwards proved to be, played in the symptoms shown.

A colt dying from a pelvic abscess after castration exhibits quite similar symptoms, and the possibility of a pelvic abscess could not in this case be excluded. Happily the scrotal lesion was undoubtedly merely a coincident. In spite of the assurance of the owner to the contrary, my opinion is that a scirrhus cord had existed there unnoticed for some time, and rapidly developed a suppurating centre during the time the horse was suffering from pneumonia, the debilitated condition of the patient doubtless favouring the process. The sinus is still being injected with a solution of perchloride of mercury, and the tumour is rapidly dispersing, and will undoubtedly disappear in a short time, my experience of these growths being that it is quite unnecessary to remove them: it is quite sufficient to open them up and inject with sublimate in pretty strong solution.

AN ACARDIAC MONSTER.

BY O. CHARNOCK BRADLEY.

Cases of twins developed from one ovum, where one twin flourishes at the expense of its less fortunate partner, are not by any means uncommonly met with in veterinary practice. This is evidenced by the fairly frequent descriptions in veterinary periodicals of so-called "moles." It is not, therefore, with the idea of describing any monster of startling newness that I am tempted to record the anatomical peculiarities of one such anomaly; but rather because "moles," as described most commonly in veterinary

journals, are viewed from the exterior only; their inner organisation being, for the most part, either ignored entirely, or treated of in a very cavalier manner. No doubt the external form and semblance of any monster is a matter of interest, but alone it is not satisfying; nor, indeed, is it always a trustworthy indication of the most important peculiarities of the organism. The outer architecture of a monster may be entirely misleading if taken too implicitly as a reflex of the internal furnishings. Especially is this the more likely to be the case when the malformation is great.

The subject of the present note came to me from Mr. Geo. W. Carter, F.R.C.V.S., of Keighley, who also, at some personal inconvenience I feel sure, provided clinical facts which will no doubt be of more interest to the practitioner than the anatomical peculiarities disclosed by dissection. Mr. Carter writes as follows:—"I had delivered a fine, fully-developed bull calf, living and vigorous. When feeling if another calf was present, I discovered the 'mole,' which I at first thought, judging from the feel of it, might possibly be a uterine tumour attached by a distinct peduncle. I do not think there were any separate fœtal membranes, as on grasping the object and bringing it into the vaginal passage I did not find any coverings; but there was a distinct umbilical cord (which I had imagined to be the peduncle of the tumour) attached about midway between the hairy patch and the inferior extremity of what I judged to be the intestines of the 'mole.' The cow made a good recovery, and the calf also did well; in fact, beyond the above abnormality there was no deviation from a normal parturition."

The external form of the monster is shown in the accompanying rough

sketch. An oval area of thick skin, ultimately proving to be over the spine, was provided with curly hair, such as is usually found over the frontal

region of calves. The only other skin left on the monster was a narrow fringe of thin hairless membrane attached to the margin of the hair-bearing patch. That part of the ovum covered by hairy skin felt irregular and resisting, giving the impression that here was some part of the skeleton; this, indeed, proved to be the case. The greater part of the monster was evidently formed by an intestinal mass; the intestines being matted together and covered by adherent peritoneum. The umbilical cord mentioned by Mr. Carter had been removed, and no trace of it was to be found.

On removing the peritoneum, a complicated coil of intestines was revealed; these were firmly joined together by fibrous tissue containing a considerable amount of fat. Blood-vessels were abundant, and passed towards the lesser curvature of the intestines. The intestines were evidently representative of both large and small, though this was not determined by any difference of calibre of the tube, but by the presence of a fairly well-developed cæcum situated at the point indicated by A in the sketch. The distal end of the "large intestine" terminated blindly in a depression in the mass of bone and cartilage representing the skeleton. In the position B (in the figure) a small oval sac was found connected with the "small intestine" by a thin imperforate cord. This sac turned out to be the stomach. It had neither entrance nor exit, and was evidently rumen, reticulum, and omasum thrown into one, the mucous membrane in different regions of it showing clearly the usual peculiarities of these compartments. There was no trace of mucosa corresponding to that of the abomasum.

On investigation the skeleton turned out to be a heterogeneous mass of bone and cartilage, the identity of which could not be further determined than that there were traceable remote resemblances to the bodies of vertebræ.

No other organs could be detected. The muscular tissue was not abundant, and what was developed was arranged in irregular strata alternating with adipose tissue.

The case is obviously one of twins developed from one ovum, and consequently having one set of fœtal membranes and a mutual placental circulation. One twin gains the upper hand, so to speak, and interferes with the circulation in the other. The result on the less vigorous twin is that it becomes, as it were, a mere appendage to its more fortunate co-habitant; ceases to develop normally, and becomes a monster to which the name *acardiac* is attached from the fact that, among other things, the heart is not present, there being nothing for it to do, as the circulation for both fœtuses is carried on by the normal twin. The condition is a very interesting one, and it would be instructive to know if it occurs more frequently among bovine or equine animals. This is a point that can best be cleared up by the practitioner whose lines have fallen in breeding districts.

Extracts.

A VINDICATION OF THE VETERINARY SURGEON.

(*Extracts from Speeches delivered in the German Parliament.*)

DR. MULLER said:—The question which I propose to put to the Home Secretary is, in my opinion, a timely one, as this House will have in the

course of the present session to deal with the regulations for meat inspection—a subject which, if not immediate, is at least in intimate connection with veterinary medicine and therapeutics. The question of the preliminary training of veterinary candidates is one in regard to which we are flooded with petitions from veterinary surgeons every year. It is desired that candidates for admission to veterinary colleges should possess the leaving certificate of high schools, and every one who knows anything about the matter knows that this demand is quite justified. The developments that have taken place in recent times in natural science, the extraordinary advance in anatomy and physiology, in biology and morphology, in connection not only with human life but also with the life of the domestic animals, make such great demands on the intellectual powers of the student that only highly trained youths are worthy of admission to our veterinary colleges. I cannot see why a lower training should be accepted for the veterinary than for the medical curriculum; the only difference is that they have different subjects on which to operate—the scientific method is the same. Think only on the field of bacteriology, and what an important influence it has in the fight against animal disease, and you will admit that the demands made on the knowledge and skill of veterinarians are as high, if not quite so delicate, as those made upon medical men, who have to deal with only the one subject, the human being.

But this is a question that affects not only veterinary science, but also veterinary rank. At present veterinary surgeons and veterinary students have to content themselves with a position subordinate to that of the medicals. Young men studying at veterinary colleges are looked upon by university students as their inferiors, and this scornful treatment is carried into social life. But now the Imperial Government is going to assign to the veterinary profession responsible duties in connection with the meat supply of the whole population of the country—a task the importance of which can hardly be over-rated. By our former legislation on cattle disease we increased the scope and difficulty of veterinary work, but the social position of veterinarians has remained unchanged, and this very much because the want of preliminary training, as testified by certificates, constituted a blemish in the eyes of the thoughtless public. Can we blame veterinary men if they ask us, seeing that they do equally important work with the medicals, to give them equally high rank by making our preliminary examinations equal for both faculties? I think it is well worth consideration whether we cannot accede to this request, if only to further the efficiency of veterinary surgeons as members of our administration. I would ask the Home Secretary for his views on this subject.

The HOME SECRETARY replied.—A petition on this subject has been sent in to the Government, and is at present under consideration. I remember that a few years ago—I think in 1893—a petition came from Prussia asking for the moderation of these examinations, but this, it is true, was strenuously opposed in Parliament. In Austria the preliminary examinations have been stiffened, and this has caused a considerable falling-off in the number of the candidates. The candidate who is able and willing to undergo these increased examinations will, as a practical man, prefer to exercise his skill on the more highly organised creature, the human subject. If we stiffen our examinations I expect that our experience will be the same as Austria's. The petition to which I have referred has been handed over to the Public Health Department for discussion.

Dr. OERTEL (Saxony), said that whilst he was personally quite of the same opinion as Dr. Müller, he regarded the objection of the Home Secretary as very serious. He further thought it was a pity to mix up the question of meat inspection with the other; it might prove difficult to get meat inspectors with High School certificates.

Dr. MULLER replied.—Veterinary training must always stand in the most intimate connection with meat inspection, as veterinary surgeons must in *any* case be the teachers of inspectors, and must always form the court of final appeal in cases of difficulty and uncertainty. I disagree with the Home Secretary. Students of the veterinary colleges at the present time are sneered at by University students as "cow doctors," and looked down upon as second-rate men, and such treatment is extremely discouraging in these days when men are so touchy—perhaps too touchy—on the point of honour. This disability, which pursues a man from the beginning to the end of his career, is not exactly calculated to allure ardent youth to devote itself to veterinary practice, whilst if, by increasing the difficulty of the examination, both in extent and depth, as well as improving the financial conditions, greater equality could be introduced between the medical and the veterinary professions, there would be no lack of veterinary candidates. I doubt very much whether the Home Secretary is right in saying that, granted equality of examinations and conditions, a student would naturally prefer human medicine. Take, for example, the men who, having been carefully trained in the subject, remain permanently faithful to the subject of zoology: their numbers have greatly increased in recent times. It is not so much the work as the value put upon the work, the contemptuous treatment they receive, that makes men shrink from veterinary studies. The experience of the Postmaster-General is interesting. He found such a crowd of applicants, not only for the higher but also even for the humbler places in the post-office, that it was possible to select candidates for the better places who brought the very highest certificates. Now you will not surely assert that a higher degree of intelligence and culture is required for a post-office official than for a veterinary surgeon—a veterinary surgeon of to-day! No. I am quite sure that, considering the overcrowding in the other learned professions, plenty of candidates would be found for the veterinary profession if they knew that their income and status would be the same as in the medical profession. I therefore press my point. Raise the status of our veterinarians and you gain a great economic advantage so far as our agriculture and cattle-breeding are concerned. You will help towards the eradication of disease in our flocks and herds if you increase in the eye of the law the influence of capable veterinarians, On recent cattle-disease commissions this difficulty has been severely felt. and when questions arise in professional circles regarding disease in animals, the position of the veterinary surgeon in constantly found to be anomalous.

INFLAMMATION OF THE UDDER IN MARES.

THE following are abstracts of cases reported by Veterinary Surgeon Diener in the *Deutsche Thier. Wochenschrift.*

A six-year old mare showed a curious swelling on the udder. She had foaled three months before, and the foal had been weaned eight days when I saw her. The right side of the udder was considerably swollen. The

skin covering the udder was stretched tight and shining, and the right teat was swollen to twice the thickness of the left, which was normal. When slight pressure was applied, the swollen teat gave forth drop by drop a greenish-yellow purulent secretion. The whole of the right half of the lacteal gland was hot on palpation, and when it was handled, so much pain was caused to the animal that she violently resisted. When walked about she showed a stiff, awkward gait. Her general condition, apart from slightly feverish temperature (39.2° Cent.), showed nothing abnormal. I diagnosed the trouble as parenchymatous inflammation of the udder, and advised rubbing with ointment made up as follows:—

Ungt. camphor, 60 grammes.
Ol. lauri, 4 „
Sapon. virid. 16 „

I also advised syringing with a 3 per cent. solution of lysol and milking several times a day, with a view to the removal of the abundant secretion. On my next visit, three days later, the condition of the mare was very much worse. The painfulness must have considerably increased, for the mere approach of any one to her hind-quarters caused excitement. She struck out and reared, and when a twitch was applied tried to lie down on the ground to escape examination. I therefore made an injection of morphia, and this allowed me to ascertain that the swelling had greatly increased. In the vicinity of the udder on the right side there was considerable œdematous swelling, which, extending over the whole right upper part of the thigh, stretched also pretty far forward. The gait of the animal had become much stiffer, and the temperature had risen from 39.2° to 40° (Cent.). The owner said the mare had no appetite and had had several attacks of colic. Examination of the rectum showed that it was filled with fæcal balls of firm consistency. Treatment was continued, and in addition the mare got a dose of Glauber salts, and "whole" linseed was mixed in her fodder with a few carrots; later a dose of calomel was administered. The udder was wrapped in a linseed poultice. I ordered rubbing of the whole body and plenty of exercise for the mare. In two days she was very much improved; the œdema had greatly decreased. An abscess had broken on the posterior surface of the udder, from which purulent matter escaped. This was squeezed out and the cavity syringed with lysol. In three weeks the mare was quite cured.

Second case.—A five-year-old mare had been suffering from swollen udder for three or four weeks. She had had a foal three months previously. Shortly before being covered—that is, about a year before I saw her—she had been under treatment for strangles, but the disease passed off rapidly and seemed to leave no "dregs" behind. The foal, however, died of strangles when four weeks old. Examination showed the left mammary gland much swollen and very tense. Greyish green pus of unpleasant odour and viscous consistency exuded from the swollen teat. Treatment as in the first case was adopted. Two days afterwards a fluctuating part was found on the left side of the udder; this was at once opened and about 15 cubic centimetres of greenish pus removed. This mare was likewise cured in three weeks.

Third case.—A six-months' old filly had the right mammary gland much swollen and very painful. Treatment as before. Abscess as in other cases. Cure in ten days.

It is worthy of note that in all three cases only one mammary gland was affected, whilst the sound gland in the two first cases gave out an apparently healthy milky secretion. In the third case, of course, there was no glandular activity. The symptoms in all three correspond with mastitis parenchymatosa as observed in the cow, except that the secretion did not consist of flaky curds or watery milk, but was viscous and purulent. In the cow, after the inflammation disappears, generally hardening of the "quarter" remains. In these three cases the symptoms, which appeared grave at the beginning, soon vanished and left no hardening. The tendency to abscess formation is also to be noted. Whether the animals treated by me will recover their milk-producing power remains to be seen. Perhaps the metastatic processes produced by the streptococcus of strangles are here exhibited.

INFLAMMATION OF THE TONGUE IN CATTLE.

(*Glossitis Traumatica.*)

THIS disease is characterised by a greater or smaller excoriation at the base of the free portion of the tongue, which, in consequence of continued irritation (by chaff, fibres, fragments of wood, &c.), may lead to a deep cup-like ulcer. This cavity is sometimes found quite filled up with material forming a kind of felt which, in consequence of slow decomposition processes, gives forth an extremely loathsome smell. The symptoms are those of stomatitis. When the excoriations are superficial the course of the disease is short, but if a deep ulcer has been formed and has been filled up with all sorts of rubbish, the trouble becomes chronic and can only be cured when green food is given. The treatment is the same as in stomatitis: soft food easily masticated, removal of the material from the ulcers, and thereafter light doses of arnica, tincture of aloes, carbolic acid, and so on.

(*Thierärzt. Centralblatt.*)

DIABETES INSIPIDUS IN THE DOG.

A SIX-YEAR-OLD dog had shown for fourteen days unquenchable thirst. He drank greedily of water and milk, and even licked water-taps. At the same time he voided great quantities of urine. In twenty-four hours he would drink 5 litres of water and void the same quantity of urine, which was quite clear in colour with neutral reaction; it contained neither sugar nor albumen nor bile pigments. Only one-tenth per cent. of solids could be found in the urine. I prescribed the following, one table-spoonful to be given twice daily:—

Potassii bromidi,	. .	5 grammes.
Syrupus simplicis,	. .	50 „
Aquæ destillatæ,	. .	150 „

The quantity of water drunk and urine expelled decreased daily. On the fourth day after treatment he drank only one litre of water and voided the same quantity of urine. His condition improved from day to day, and in fourteen days the urine was bright yellow with acid reaction; it con-

tained a little over seven-tenths per cent. of solids, but no albumen, sugar, or bile-pigment. The treatment was continued, and in three weeks the urine was normal ; the animal was cheerful, drank one litre of water, and voided three-quarters of a litre of urine daily.

(*Bulletin de la Soc. Centr. de Méd. Vét.*).

DEATH FROM BEE-STINGS.

WHILST two hives of bees were being transferred from one place to another in a Russian village, two young colts were stung by the angry bees, and thereby, whilst the one colt was affected only by a slight swelling on the side of the neck, the other showed a flat swelling as big as the palm of one's hand at the upper end of the trachea. On the following day the one animal was back to its normal condition, but the other was very much worse on account of the great increase of the swelling. This went on so rapidly that in forty-eight hours breathing had become so difficult that tracheotomy had to be performed. Difficulties in swallowing succeeded, gangrenous pneumonia set in, and the animal died in six days.

(*Oest. Monatsschrift.*)

PARALYSIS AND PROLAPSE OF THE PENIS IN A STALLION.

A FOURTEEN-YEAR-OLD stallion was sent to me to be treated for colic. Four days after my first examination I found that the colic was still intermittent, and that the penis had fallen forward and was without feeling and limp. The animal had had a severe attack of colic the night before. I prescribed—

Acid. arseniosi, ...	½	gramme.
Rad. gent. pulv. . . .	10	„
Aloes pulv.	5	„
Placent. semin. lini, . . .	5	„

To be made up into six powders; one powder to be given every twelve hours. Reposition of the penis several times a day was necessary. This went on for six days. The pulse varied from 64 to 72, temperature 38·2° to 38·7° (Cent.), and respirations 16 to 18 per minute. The projecting part of the penis was on the sixth day profoundly œdematous, without feeling, and cold, and the folds of the prepuce of a bluish colour. With instructions as to diet, I ordered scarification of the penis and washing with creolin, also rubbing of the whole region with spirits of camphor and tincture of iodine. As no improvement took place, I ordered washing of the penis with a decoction of oak-bark and rubbing of the parts with oil of turpentine. Later on I tried syringing with strychnine, then I injected $\frac{1}{20}$ gramme of veratrin into the neck and washed the penis with an infusion of arnica. The veratrin caused a swelling in the neck and shoulders which lasted eight days, and made the patient very irritable and cross. I had therefore to give it up. This condition of the penis lasted from 11th July to 1st October. Then I had the animal cast, the penis replaced and kept in position by two stitches. The animal took its food and water, but

gradually went out of condition, and latterly became unsteady in his gait. On 12th October the stitches gave way through suppurative inflammation of the foreskin, and the penis fell out again. On the 21st the animal was destroyed as being incurable. Unfortunately I could not make a post-mortem examination. What caused the paralysis of the penis, and why that appeared as a complication of pronounced colic following on stoppage of the bowels—possibly of the cæcum—I do not quite understand. Probably it arose from some injury to the spinal cord, or from embolism in one of the two pudic arteries, but it may have been caused by an injury to one of the muscles of the region produced in the course of one of the colic attacks.

(Vet. Sur. Hoeck in the *Maanedskrift for Dyrlager.*)

THE NEGLECTED ARMY VETERINARY DEPARTMENT.

A WAR like the present one, in which so many mounted troops and transport animals are necessarily employed must try to the utmost the resources of those branches of the service whose work brings them in contact with animals.

It is a matter for regret, therefore, to hear that the Army Veterinary Department has been allowed, by the apathy and neglect of the War Office authorities, to fall into the same discontented condition as that of the medical service some years ago.

There has been a good deal of sympathy expressed in the daily press for the sufferings of the horses, and with the large numbers of animals required in South Africa one would have thought that an efficient Veterinary Service would have been one of the first essentials. If not urged on grounds of humanity it is dictated by common-sense and economy.

It is strange that the matter has escaped the attention of such a horse-loving nation, especially after the accounts of the severe losses which took place through illness and accident on several transport vessels which had not, at the time, a veterinary surgeon on board.

The duties of an army veterinary officer are by no means confined to the sick and wounded horses; he has to give advice regarding the management of large numbers of animals under all kinds of conditions, on board ship, in camp, and on the march. He must know thoroughly all the army regulations relating to the subject of animals, their transport, varieties, and quantities of forage required, the supplies of medicine, clothing, harness, and general equipment, together with the amount of load they can carry or draw. In addition he must know the details of drill and the management of men. For a long time past a military career has been looked at askance by the best graduates from the various veterinary colleges, and latterly there have been more vacancies than there have been suitable candidates to fill them.

At the outbreak of the war the department was about 10 per cent. below its authorised number, although even this authorised number has been represented over and over again to the War Office authorities as barely adequate even in time of peace, and absolutely inadequate in the event of war. The unpopularity of the service has been demonstrated even as recently as last session, when a deputation from the Council of the Royal College of Veterinary Surgeons was received by the Secretary of State for War. Grievances requiring redress were pointed out, and sugges-

tions put forward for attracting the best students. Even the small matter of granting a military title without a prefix—the point for which the Army Medical Service fought so persistently a short time ago, and which they consider now to be of the greatest advantage, and well worth all the trouble taken to obtain it—was refused in terms which gave great dissatisfaction to the whole profession.

The Army Veterinary Department is the only one which now retains the compound title, and it this invidious distinction, together with the excessively slow rate of promotion, which is very much complained of, and rightly too, when their medical *confrères* and even riding-masters have single combatant titles. In actual warfare the veterinary officer, although on an errand of mercy, is actually ranked as a combatant, and is not protected by the Geneva Cross. As a practical present-day evidence of his presence in the fighting line we have the instance of the capture of Veterinary-Lieutenant Shore with the Hussars in the expedition which led to their being sent by the Boers as prisoners to Pretoria.

Thus the matter remains, and the best men, who would otherwise take up a military life, prefer civil practice, where they can make a far more lucrative calling and have a more pleasant time. Even those of the students who have independent means take the same view, and will continue to do so until matters are reorganised. A few promises from the War Office authorities might have saved the country hundreds of thousands of pounds, as, instead of having to send out cargoes of valuable horses without skilled veterinary supervision, whereby numbers were lost, the department might have been fully equipped and ready for any emergency. It is true that the profession have responded splendidly to the call for volunteers, the younger graduates in particular having come forward, but it must take even the best men some months to become efficient in military organisation and transport, and the loss of efficiency comes just at the most critical time. About seventy civilian veterinary surgeons have been employed, this being nearly double the number of departmental officers who were in England at the outbreak of the war.

The War Office authorities, who are mostly elderly men, seem to have no conception of the progress which has been made in the profession during the past twenty years. They still seem to associate the veterinary surgeon with the farrier and cow-leech of olden times. Years ago, before the Veterinary Surgeons Act was passed, any one, whether horse dealer, groom, or charlatan, could, if he felt so disposed, call himself a veterinary surgeon and practise as such. The present day veterinary surgeon has to pass the same preliminary educational test as the student of human medicine, and then to submit himself to a course of at least four years' duration before he can emerge with the diploma licensing him to practise.

Army life, with its red tape methods, has no great inducements for those whose future bent is scientific research, its social and pecuniary aspects do not outshine those of the successful practitioners in either town or country, and when one hears, in addition, of the very curt way in which the application for redress of grievances is met, it is not to be wondered at that the service is not as popular as it should be.

Complaints of the excessive work, and impossibly large areas to supervise, are to be met with in every branch of the department, especially in India, where one officer is often required to do his best to inspect a district larger than several English counties joined together, and an area too in

which contagious diseases of the most virulent kind are rampant. If his health breaks done under the strain he is invalided or dismissed the service with a totally inadequate compensation.

The marvel is how the Director-General has kept things going successfully for so long; it can only have been by the exercise of the utmost effort and energy, as over and over again one man has had to do the legitimate work of three. Inquiries will be made, reorganisation and reconstruction must take place after this war is settled, and amongst others no doubt the Army Veterinary Department will receive its share of attention. It is essential for the future of the Empire that all the departments, small as well as great, shall be kept efficient and ready, as the breakdown of one at a critical moment may mean the breakdown of all. The importance of attention to the health of our cavalry and transport animals cannot be overestimated, for upon their fitness must depend largely the food supply and success of our troops, especially in a war like the present, where mounted troops form such a large and necessary item.—*The Physician and Surgeon.*

BOVINE TUBERCULOSIS.

Between 1890 and 1898 the total number of bovine animals insured in the Canton of Freiburg (Switzerland) rose to 174,568. Of this number 4085 were slaughtered when on the point of death, or succumbed to disease; the percentage is therefore 2·34, which is a normal figure. According to the reports of veterinary surgeons, of these 4085 animals 639 were affected by tuberculosis of one degree or other—that is, 15·64 per cent., or ·36 of the total number of animals insured. During this period of nine years there had thus been observed one case of tuberculosis in 273 animals. M. Strebel thinks this figure too low, and he attributes it to the difficulty which veterinary surgeons frequently find in making a complete post-mortem examination, and in examining the lymphatic glands, the udder, the spleen, &c. On the other hand, he thinks that certain lesions escape notice in examinations made by non-veterinary inspectors. He thinks it possible to deduce from the tables of insurance companies, and from his long personal experience, that there is a great difference, from the point of view of the frequency of tuberculosis, between cattle that have been from their earlier days accustomed to pasture on the Alps, and to be fed during winter on hay, and those which are kept almost constantly in the byre. If the latter receive likewise rich food, consisting of industrial residua, they are transformed into veritable milk factories. But this treatment diminishes their physiological resistance, and so modifies their organism that it presents an excellent cultivating ground for the bacilli of tuberculosis. It is for this reason that Freiburg cattle, which are sent to the Alps for a good part of the year, are almost entirely immune to tuberculosis.

(*Schweizer Archiv.*)

ANTI-ANTHRAX VACCINATION (PASTEUR METHOD.)

It is stated that in cases of enzootic anthrax vaccination the Pasteur principle is very efficacious. This is confirmed by Herr Barkow, who communicates to the *Deutche Thierärzt. Wochensch.* his experience of the

treatment. Anthrax had been raging for several years permanently amongst the cattle, the sheep, and even the horses on a very large farm. At particular periods, especially in spring and autumn, the disease would carry off two to five cattle and ten to twenty-five sheep in a week. The cause of this great mortality was that the bodies of animals dead of anthrax were used for the preparation of a manure which was spread over the pasture lands and corn-fields. The ordinary measures of sanitary police proving insufficient, Herr Barkow had recourse to vaccination, with complete success. In the beginning of May he inoculated 250 cattle, amongst which were cows in the fourth month of pregnancy, and calves eight weeks old. Herr Barkow says it is safe to vaccinate pregnant cows up to mid-term at least. In June 100 other animals, including purchased cattle and cows which had calved, and likewise calves, were subjected to vaccination. The young animals showed only insignificant reaction, in fact almost none, and the appetite remained unaffected; the aged animals had for the most part only a feeble reaction, with slight diminution of appetite and lactation. A few only had fever, sometimes with slight rigor, want of appetite, and dullness for only two or three days. After vaccination anthrax disappeared. It might almost have been fancied that it would never reappear, but this hope was not justified by events. Towards the end of June a cow was found dead in the byre one morning, and in the beginning of July two oxen succumbed in less than thirty minutes. These animals which had eaten new hay coming from infected meadows, were found at the post-mortem to be affected with anthrax. A second vaccination was performed at twelve to thirteen days' interval from the first, on all the animals on the farm. From this time onwards—that is, from July 1898 to January 1899—no case of anthrax has appeared, although provender from the infected fields and meadows was used for the animals. It remains to be seen whether the immunity from anthrax conferred by this double vaccination will endure for more than a year, and whether the operation will have to be repeated after that interval. It is worthy of notice that the swine on the farm, though running at liberty over the infected fields, never contracted the disease. This fact confirms what we have learned as to the immunity of swine in regard to anthrax.

ON THE LESIONS OF RABIES IN THE DOG, AND THE POST-MORTEM DIAGNOSIS OF THIS DISEASE.

THE question of the post-mortem diagnosis of rabies has been, till recent times, surrounded by many difficulties, the disease being specifically characterised by the absence of any gross organic lesions, and those which are encountered being neither constant nor specific. Apart from the presence in the stomach of a certain quantity of foreign bodies, such as straw, morsels of wood, fragments of brick, &c., which we cannot otherwise explain, as well as the hæmorrhagic gastritis which the presence of these foreign bodies produces. We observe most frequently at the autopsy of rabid dogs only ill-marked lesions. We are therefore obliged to have recourse to the inoculation in the rabbit of the nervous matter of the suspected animal in order to establish our diagnosis with certainty. This method has the drawback of requiring generally eighteen to twenty days for the production of its effects; this delays considerably and may render

problematical the preventive treatment required by persons bitten by the suspected animal. M. Nélis, of Louvain, has written a treatise giving the results of his personal investigations on fifteen rabid animals (ten dogs, four rabbits, and one cat), and seems to have arrived at a fairly precise characterisation of the lesions produced in the nervous system by the virus of rabies. The most constant and the profoundest lesions affect the cerebro-spinal and sympathetic ganglia, and consist in the atrophy, invasion and destruction of the nerve cells by cells of new formation, which appear between the said nerve cells and the endothelial capsule.

There exists, then, first, in the mass of the nervous tissue a leucocyte infiltration having its seat in the supporting connective tissue, and this is followed by the production of new cells which penetrate between the endothelial elements of the capsule that surrounds the nerve cell, dislocate these elements, and end by occupying the cavity of the cell wall. From the researches of M. Nélis it appears that all the cerebro-spinal and sympathetic nerve-ganglia may be the seat of the lesion in question, but the ganglion of the trunk (vagus) seems specially to show it in a very marked degree. To bring this out the time taken in examining the affected ganglia is very short in comparison with the inoculation process, and this forms one of the strong points of the method; therefore it becomes tolerably easy to settle the diagnosis of rabies in a few hours (about fifteen) by the mere microscopic examination of the ganglia.

With the object of testing the results of the plan devised by M. Nélis, we proceeded to examine with the microscope the nervous ganglia of rabid animals, or those suspected of rabies, which were sent in to the veterinary college. Of some of these the diagnosis of rabies was made during life, whilst in the case of others sent to us dead, the microscopic examination was tested by inoculation of rabbits with the medulla. The following are our results:—

(1.) Dogs in which the existence of rabies was ascertained during life —six cases; in all we found the lesion in the ganglion of the trunk (vagus).

(2.) Suspected dogs sent to us dead for diagnostic purposes—twelve cases; of these we verified the existence of lesions microscopically in eight cases, and of these we confirmed five by the inoculation of rabbits. The three others, having died of septicæmia, were useless for our purpose.

Four other animals in which we could not discover the above-mentioned nervous lesion, were proved to be non-rabid by means of test inoculations. On the other hand, a dog which had died of meningo-encephalitis, whose ganglia we also examined, showed none of these lesions. These observations confirm the statement of M. Nélis in all points.

Our opinion, based on the above data, is that every dog is to be considered rabid if one of its nervous ganglia shows on microscopic examination an infiltration of the endothelial capsule of the nerve elements by leucocytes. Therefore, in the event of bites, prompt measures ought to be taken in such cases.

The quick diagnosis of rabies is extremely important, both from the scientific and the humanitarian point of view, and although these lesions of the ganglia have proved quite trustworthy proofs hitherto, we think more experiments ought to be tried for purposes of confirmation. Practitioners ought therefore to send specimens to veterinary colleges for investi-

gation. As the ganglion of the trunk (vagus) is apparently the most important one, it will be sufficient if the head of the animal, plus the upper part of the neck, be sent. Putrefaction takes place rapidly in rabid subjects, and may give rise to septicæmia in inoculated animals; therefore great expedition should be used in sending in specimens, and all possible information regarding the subjects should accompany these.

For those practitioners who wish to experiment for themselves, we subjoin directions for removing the ganglion and making microscopic preparations.

The ganglion of the trunk (plexus gangliformis of Willis and Vieussens in man) is fusiform in the dog and very much elongated; it may attain one centimetre in length in big animals. It is placed on the pneumo-gastric nerve, a little behind its exit from the cranium by the jugular foramen. It is situated near the upper cervical ganglion, which it touches, and from which it is easily distinguished by its colour, volume, and connections; whilst the vagus ganglion is greyish, longer, and of smaller diameter, the cervical is ovoid, reddish, and placed on the great sympathetic nerve. It is connected with the rectus capitis anticus major muscle and the upper border of the carotid artery, near its termination. It is from this ganglion that the upper laryngeal nerve starts, and the pneumo-gastric immediately after its issue from the lower extremity of this ganglion joins the great sympathetic, to form, along with the latter, only one common trunk. Its dissection is therefore easy. After removing the skin and the muscles which conceal the lateral face of the larynx, we come, above this, upon the common trunk of the pneumo-gastric and the sympathetic, which we follow upwards to a point below the ala of the Atlas and near the tympanic bulla, where we see that trunk bifurcate; one of its branches, the bigger, shows the trunk ganglion, the other, more delicate, carries the upper cervical ganglion. The ganglion, separated from the nerves which issue from it, must be placed in pure alcohol for at least twelve hours, then it must be placed in xylol or chloroform for one hour at least, after which it is mounted in paraffin.

(M. G. Hebrant in the *Annales Vét.*)

STERILITY IN THE MARE.

Herr Foete, writing to the Berlin *Thierärztliche Wochenschrift*, says that he has made minute and laborious investigations into this subject, and as a result he estimates the percentage of mares which do not conceive after being served as high as 30. The fault may lie with the stallion or with the mare, but it is generally the latter. Treating only of defects in the mare, the author says that the hygienic conditions surrounding our mares must play a certain part. These animals are not used for reproductive purposes only, but are also beasts of burden; in them periods of heat are often very short, and may even pass unnoticed. We may presume that the maturation of the ovum is affected by this cause. The conditions necessary for fecundation are (1) that normally developed ova be produced during the periods of heat; (2) that these ova come into contact with active spermatozoa; (3) that the state of the vagina and uterus be such that the semen may retain in them its vitality till fecundation takes place, and that the fecundated ovum may find in the uterus the elements neces-

sary for its further development. It frequently happens in the mare that one or other of these conditions is not fulfilled, and sterility, temporary or permanent, is the result. In some cases the ovaries are incompletely developed, and ovulation does not go on properly; in aged mares we may find that senile atrophy of the ovaries has taken place. Sometimes also these organs become the seat of more or less malignant tumours, which interfere with the formation of the follicles (hæmatoma, adeno-carcinoma, dermoid cyst, &c.). A pretty frequent lesion consists in the evolution of ovarian cysts, which sometimes attain enormous development. These lesions often give rise to symptoms of nymphomania in mares. Although the manual process required is a little more difficult than in the cow, we may bring about the rupture of these cysts by compression of the ovaries through the rectal wall. Fecundation may also be hindered by anomalies of the oviduct (congenital lesions, inflammatory affections, tumours, &c.). The most frequent obstacle is found in the cervix uteri; whilst in normal conditions the cervix permits, at the period of œstrum, the introduction of two fingers, it sometimes happens that this passage remains entirely closed, and the semen cannot enter the uterus. This anomaly can be easily modified by artificial dilatation, and the operation is best done with the fingers properly disinfected; it ought to be performed a short time before copulation. Results obtained by Danish practitioners are very satisfactory; one obtained 50 per cent., another 66, and a third 75 of fecundations in otherwise sterile mares.

In other cases the cervix is injured by the presence of tumours or polypi, which prevent the passage of the semen. When these cannot be removed, we may have recourse to artificial fertilisation, injecting the seminal fluid directly into the uterine cavity. This process is to be recommended when the mare makes expulsive efforts after copulation and rejects the semen; it is largely practised in America. The Americans, being practical people, say that, a single spermatozoon being sufficient for fertilisation, it is useless to introduce millions into the uterus; therefore they fertilise three mares with the semen which would ordinarily have sufficed for only one. In order to accomplish this they have a mare served which has a closed cervix, and take up with a special syringe the semen which has been injected into the vagina. Semen preserves its properties for twenty-four hours if proper precautions are taken against cold, desiccation, action of acids, &c. A Hungarian veterinary surgeon has observed that gestations thus obtained exceed the normal period by from ten to fourteen days.

It may happen that the mare is affected by slight chronic catarrh of the uterus or vagina; it is believed that the products secreted in these cases present an acid reaction, but when this occurs the desired result can be attained by alkaline injections with bicarbonate of soda.

INTRAVENOUS INJECTIONS OF ANTITOXIC SERUM.

In the case of sera the advantages of intravenous injections over ordinary subcutaneous injections are:—

1. An immediate and complete diffusion through the whole organism.
2. A less diluted state when they come in contact with the elements which they are to act upon, since they find themselves suddenly

cast into a small quantity of venous blood, then arterial, and thus projected in all directions, instead of slowly diffusing themselves into the whole mass of blood and lymph,—absorption being carried on in these two ways in the case of hypodermic injection.

This method may be of importance in the case of tetanus, for in this disease the therapeutic method which gives the best results is that which produces the most direct and the quickest contact between the nervous cell and the antitoxin, thus allowing the overcoming of the *inaffinity* between that cell and the antitoxin. It is necessary in therapeutics to set off even the least advantages against disease. The method of intra-cerebral injections is hardly practicable with animals because of the difficulty of accomplishing the operations, and, above all, the dangers connected therewith; and, besides, the results obtained have been exaggerated. The method only succeeds if applied early; it necessitates aseptic and antiseptic measures difficult to obtain, so that we must stand by helpless, as formerly, in the case of tetanus. The advantages of intra-cerebral injection are minimised by its inconveniences and the uncertainty of its results.

The employment of antitetanic serum in intravenous injections can but increase its chances of preservation. It may be admitted that when the impregnation of cerebral cells is only at its early stage, the antitoxin will not be totally deprived of effect if it is introduced into the circulation. It is quite certain that if the tetanus becomes generalised, and that it is an acute case, the action of the serum will be of no avail. But all cases of tetanus are not of fatal swiftness; on the contrary, the process is often very slow. I recall the observation, which confirms the action of the serum, namely, that if a cure is brought about convalescence is considerably abridged, and the restoration to health complete.

3. The suppression of abscess complications, especially in the case of antistreptococcic serum.

In the circulation phagocytosis is very active, since it is possible to introduce by this means certain very virulent products, such as pleuro-pneumonia bacteria, anthrax bacilli, and streptococcus pyogenes, which, injected by any other channel, cause the gravest troubles. Besides, dust, which in spite of all precautions is apt to penetrate as well, is stopped by the pulmonary filter, and can thus cause no serious disorder. The perfect harmlessness of these injections is further shown by this fact, that a large quantity of artificial serum can thus be injected, more or less filtered. It is also known that by this channel the administration of even $\frac{1}{5}$th of chloride of barium, which is a very strong solution, never occasions any local mishaps.

Is there any real advantage to be gained by employing artificial serum in intravenous injections? I think so. In a horse I have often injected this serum under the skin; its absorption is slow, and followed by œdema at the point of injection. It is likewise necessary to make many injections. By the intravenous injection the absorption is immediate and complete; the entrance to the blood is more direct; the functions are directly stimulated. Indeed, one notices during injection, at the end of a few minutes, a tolerable amount of salivation, accompanied by movements of deglutition. I have never bled my patients before making this intravenous injection. The bleeding only fulfils its purpose when it is done at the

same time as the injection. The blood tension is apt to vary in one way or another, and very largely, since one is able to take more than 1½ gallons of blood from a horse. I do not see the utility of bleeding—which only weakens an already feeble subject—for the injection of artificial serum. The equilibrium of the blood pressure will soon right itself, if not simultaneously with the injection, yet by the secretions, which are much stimulated.

What dose of artificial serum should one inject? The quantity may run from about 500 to 800 grammes (say, from about 17½ oz. to 28 oz.); one injection, and sometimes two, in a day. In one case where I reached the dose of 1200 grammes (say, 2 lb. 8¾ oz.), I noticed, towards the end of the injection, at the same time as the moderate salivation, muscular tremblings, which lasted half an hour or so; this had no other inconvenient effect, and was followed by an improvement in the condition of the patient.

Granting that artificial serum has a general stimulating action and an antitoxic action, its use would be indicated as desirable in affections characterised by the absorption of large quantities of toxin,—an absorption often followed by intestinal complications, perhaps by the same mechanism as the toxin of *Bacillus coli communis*, that is, diminishing the natural resistance of the organism against the intestinal microbes; and also in those which, like tetanus, are complicated by intestinal stasis. If the deglutition of liquids is impossible after a certain time, its use will be all the more justified.

(G. Moussu in the *Rec. de Méd. Vét.* 15th Dec. 1899.)

FRACTURE OF THE PASTERN AND THE CURE FOR IT.

I READ with great interest M. Barrier's communication to the "Société Centrale de Médécine Vétérinaire," on the pathogeny of fractures of the phalanx in race-horses, with regard to the case of fracture of the pastern in Holocaust in the Derby.

On the 17th of April last I observed a case of fracture of the pastern in a mare which is now almost healed, and which proves that M. Barrier has indicated the true conditions of fractures when he says "the fracture is almost always the result of a sharp pulling up, or of a sudden stop of the whole body while moving." The following is the case:—

On the 17th April I was asked to visit a blood mare, nervous and very highly strung, fourteen years old, belonging to Dr. B. I found the animal walking on three legs, and even when resting she did not place her near hind foot on the ground. I examined the fetlock and the pastern, and discovered a transverse oblique fracture of the near hind pastern. According to the servant this was how it happened:—The mare was drinking water and was fastened to a halter, when a carter passing near with his horses cracked his whip. The animal taking fright broke her halter and galloped off. Excited by the shouts of some youngsters who followed her she put on the pace, and going at full speed came up to a breast-work overlooking a road. Suddenly, seeing the gap before her, she stopped short, and at that moment the people following her distinctly heard a cracking sound. The mare returned on three legs. The sudden halt, combined with the great speed at which the animal was going, had thus been the cause of the fracture.

I immediately advised the slaughter of the mare, but the hotel-keeper

who had charge of the animal not wishing to see her slaughtered, asked me if there was no chance of cure by reducing the fracture. I objected that, considering the age of the mare (fourteen years), I could guarantee nothing; in spite of that, however, he bought the animal, and requested me to give it all necessary attention. With the help of two assistants, therefore, I at once proceeded to set the fracture by applying to the pastern a bandage made of tarlatan soaked in a strong solution of plaster. This very flexible material enabled me to make a bandage sufficiently tight covering the top of the hoof, the whole of the pastern, and extending over the top of the fetlock. The operation ended, the animal was put into a narrow stall and suspended by a leather apparatus. No complications ensued. Forty-five days afterwards the bandage was taken off, and a few days later we removed the suspending apparatus. At that time the pastern was hard and very large. Being unable on account of the great heat to use the cautery, I contented myself by rubbing it vigorously with ointment of binoxide of mercury; fifteen days later I ordered bathing, and saw the pastern diminish greatly. The mare has remained lame, but at the end of three months she was able to trot and to be lent out for hire. I intend, with the owner's consent, to try point firing, and, if necessary, to perform neurotomy high up.

I relate this case in order to prove (1) that the fracture in the present case is really due, as M. Barrier says, to an abrupt stop while going at great speed, and (2) that fractures of the pastern are the least serious, and heal quickly enough, even in old animals, with the aid of a simple plaster bandage, provided that the bone is not crushed nor any tendons broken.

Granting this, I am astonished that in race-horses, especially such valuable ones as Holocaust, some attempt is not made to heal fractures of the pastern, for, admitting the persistent lameness, Holocaust would have made a magnificent stallion. It is therefore depriving the world of the progeny of an excellent sire, one who was the finest of his generation. I know that a pure-blooded horse is very nervous and impressionable, but with the means for soothing which are nowadays at the disposal of every stud-owner, something it seems to me might well be done. The mare, the subject of this experiment, was very nervous.

Finally, a fracture in a race is an accident which may happen to the best of horses, and, for my part, when a horse like Holocaust has gone through the trial races and the journey to this country, and has furnished such performances as the latter did, one must ascribe the cause of the fracture to something more than constitutional weakness of the bony tissue. At such a speed a stumble or false step would, according to my own experience, cause the fracture; of course thin-legged horses will naturally be the more susceptible. With regard to the weakness of the bony tissue, M. Sanson spoke very justly, I think, when he said that the rich food of race-horses was sufficient to hasten the evolution of the bony system.

(M. Cavard, in the *Rec. de Méd. Vét.*, 15th December 1899.)

TREATMENT OF ANTHRAX WITH CREOLIN.

Veterinary-Surgeon Tordal, of Bergen (Norway), says:—On the 8th January I was asked by a farmer to attend one of his cows which had turned ill the evening before. On my arrival (about twenty-one hours

after the illness had shown itself), I found that the patient was still able to rise without help. She was a little, black, well-nourished cow, nine years old. There was no appetite, and milk-secretion had ceased. Rectal temperature 41, 6 (Cent.); pulse small and 80 to the minute, scarcely perceptible; breathing very difficult. The head was stretched forward, the sensorium was seriously affected, and the animal every now and then trembled in the hind legs. The rumen was nearly empty, fæces thin and watery. The owner had given her two table-spoonfuls of Glauber salts. I diagnosed anthrax, and had the animal removed to another cow-house; in walking over she staggered from side to side. Four hours later I had 25 grammes of creolin administered to her in a bottle of water; but when her owner came in six hours afterwards he found her dying. On microscopic examination of the blood a great quantity of anthrax bacilli were found.

(*Berliner Thierärzt. Wochenschr.*)

HYSTERECTOMY IN THE BITCH.

When parturition cannot take place naturally, and the Cæsarean operation is performed, it may be found after laparotomy that the state of the uterus is such that it cannot be left in its place without great danger to the life of the animal. The removal of the uterus in the bitch has in recent times been frequently successfully accomplished, but careful antiseptic measures must be taken, and it ought to be performed before the animal is too much exhausted. Laparotomy is done before hysterectomy. This is performed at the side at which one can feel the fœtus through the abdominal wall. The direction of the skin incision follows the direction of the fibres of the musculus obliquus internus. The musculus obliquus externus is split at an angle of from 80 to 90 degrees, the internus in the direction of its fibres, the transversus at an angle of 45 degrees. The skin of the abdomen is cut through with blunt scissors. The dividing of the abdominal muscles, each in the direction of its fibres, has the disadvantage that the abdominal wound is too small, and the muscular layers, which must be held apart by hooks, are apt to tear. The length of the abdominal wound varies with the size of the animal, say from 5 to 10 centimetres.

Hysterectomy, or removal of the uterus, is performed as follows:—The uterus, with the fœtus, is drawn out through the abdominal wound and laid on a sterilised cloth. We then apply a double ligature of aseptic silk round each of the Fallopian tubes, close to the ovary, including therein the ligamentum ovarii. The tubes are then cut through between the ligatures. The cervix uteri is next ligatured with thick aseptic silk at two places, between which it is cut through. Should the fœtus be so big, as in emphysema, that it is not possible to draw the uterus with the fœtus right out, it is advisable to draw out a corner, open it, and remove the fœtus through the opening. Thereby we get more room and a better outlook over the field of operation. After the tubes and the cervix have been cut through between the ligatures, the uterus can be removed. Nothing need be done to the ligatured tubes if aseptic measures have been taken, but it is otherwise with the stump of the cervix; here the methods vary according to the class of operation, which may be as follows:—

(*a.*) Hysterectomy with extra-peritoneal treatment of stump.—In this

method the uterus is ligatured in front of the cervix, the stump is pretty long and moveable, so that it can be dragged by the ligature into the abdominal wound. When the abdominal muscles are stitched we fix the ligature of the uterus in the muscle stitches and push the stump into the lowest corner of the wound. The wound requires careful aseptic treatment till the stump falls off and a granulating surface has appeared. A consequence of this operation is that a connection between vagina and cervix with the abdominal wall always remains.

(*b.*) Hysterectomy with dropping back of the stump.—In this method, after the uterus is ligatured and cut through, the stump, which shows a central ring of mucous membrane on the surface of the cut, is burnt with a Pacquelin cautery and replaced in the abdominal cavity. After this the wound is closed by stage sutures. If everything has been treated aseptically, stump and ligature become embedded in fat.

(*c.*) Hysterectomy with vaginal amputation of the stump.—In this method the stump is bent upon itself and drawn, by forceps introduced into the vagina, right into the lumen of the vagina, and, if possible, a little outside of the vulva. Then the second ligature is laid over the first and drawn tight. Five millimetres behind the ligature the cervix is cut off, so that a part of the stump falls away with the first ligature. Then the bent forward part is replaced. We have here the same appearance as after amputation in cases of prolapsus.

It need hardly be mentioned here that this operation is only possible when the cervix is opened. The stump falls off some ten days after the operation, but sometimes later, and is removed *per vaginam*. An advantage of this method is that the stump does not remain behind in the abdominal cavity, and therefore there is no likelihood of infection arising therefrom. This method can be adopted with sheep also.

It is desirable, in order to attain complete success, to observe certain precautions before operating. The animal ought to be thoroughly washed and dried beforehand, and then swathed in a bandage 12 centimetres broad, so that only the abdomen is left exposed. The hair on the abdomen ought to be carefully shaved off. Certain complications also may occur. After laparotomy, when the uterus is being drawn out of the wound, collateral anæmia of the brain may occur, which is fatal to the patient. This is likely to occur when the wound is small, so that the cornu with the fœtus acts like a sucker in the wound; hyperæmia *ex vacuo* takes place in the abdomen, with consequent anæmia in the brain. An injection syringe filled with ether ought always to be at hand. The penetration of air into the abdomen need cause no anxiety. The operation ought to be performed as quickly as possible; it ought not to occupy more than twenty minutes.

(M. G. de Bruin in the *Berliner Thierärzt. Wochenschrift.*)

ON THE DEVELOPMENT OF INTESTINAL VILLI.

In glancing over the development of the villi of the intestine, it is found that the information obtained is very meagre. It is obvious why this

should be so, for it is difficult to locate a section through a loop of intestine in order to compare it with the same loop in an older embryo. Yet it is known that the villi appear at an earlier date in the duodenum than lower down, showing that the process must be unequal in different portions of the same intestine.

In vertebrates of low order the intestine is smooth, no villi being present. Then appear longitudinal folds, and then all gradations between folds and villi, and finally villi. It is interesting to note that in those intestines in which folds of mucous membrane are present, they are more numerous and more prominent in the upper than in the lower part of the intestine. As the villi are developed they appear in the upper part of the intestine first, so stages are found with villi in the duodenum and only folds in the ileum. Furthermore, when villi alone are present, they are more numerous in the duodenum than lower down. The most striking result in following out the development of the villi of the human intestine is that they repeat all the stages found when they are studied from the standpoint of comparative anatomy. The same holds good in the intestine of the pig.

The direct method of counting the villi in the pig's intestine gives the following results :—

Table giving the Measurements of the Intestine, with the number of Villi in the Pig.

Length of Embryo in mm.	Length of Small Intestine in mm.	Width of Small Intestine in mm.	Number of Villi in one square mm. of Intestine.	Number of Villi in the whole Small Intestine.
62	240	3	48	33,760
85	305	3	55	50,325
136	795	4	72	228,960
160	1050	7	64	470,400
220	1850	9	69	1,148,850

The smallest embryos, both pig and human, in which the villi are well marked are over 50 mm. long; and their number exceeds, from their earliest appearances, 25,000 in number. From this time onward the number of villi increases rapidly as the intestine grows larger and longer.

In the intestine of a pig embryo 85 mm. long, the villi are not all of the same size, but range from small villi that are scarcely more than elevations of the mucosa to large villi that extend half-way across the lumen of the intestine. The small villi are confined to no particular situation on the wall of the intestine, but are evenly distributed; at points they are in clusters. These observations regarding the form of the villi and their number show that both old and young villi exist side by side, which proves that after the villi have once appeared in the intestine their further growth in number is by the formation of new villi between the ones already existing.

A brief summary of the development of the villi of the intestine is as follows :—

(1.) The number of villi in the intestine increases with the age of the embryo.
(2.) Fully developed villi and young villi exist in the growing intestine side by side.
(3.) The villi appear first as longitudinal folds. These folds grow larger, and then break up into villi.
(4.) The villi develop first in the upper portions of the intestine.

(John M. Berry, *Anatomischer Azeiger.*)

MODE OF PRODUCTION, AND METHOD OF ACTION, OF ANTITOXINES, ACCORDING TO EHRLICH.

MODERN bacteriological researches, notably the experiments in immunisation and the practice of sero-therapeutic injections, have raised a great number of theoretical problems of the highest interest. Amongst these questions one of the principal is, why toxic substances, which are well defined from a chemical point of view (amongst others those substances which bring about a sort of tolerance), do not cause the formation of immunising bodies in the circulation, as is the case with poisons of a microbic origin. Does there then exist between these two sorts of poisons, between those which produce antitoxine and those which do not, any essential difference? Substances productive of antitoxine, again, offer from another point of view a remarkable peculiarity, which consists in this, that the antitoxine produced by a certain poison is only efficacious as an antidote for this particular poison, and not for any other kind. The specific action of antitoxines is such a singular phenomenon that to explain the intimate connection which exists between toxines and their corresponding antitoxines, scientists at first considered the former as the mother-substances of the latter. This opinion, according to which antitoxine would be nothing but a product of toxine, is even now still admitted by some *savants*. Buchner defended it quite recently at the Congress of German naturalists and medical men held at Munich. This point of view is, however, considered untenable by M. Ehrlich.

First of all it is in contradiction to the extraordinary disproportion between the quantity of toxine employed and that of the antitoxine which results from it. In introducing into the system a specific dose of poison, one may obtain a quantity of antitoxine capable of neutralising 100,000 times the dose of toxic substance introduced. A second argument of the same kind is the very slight difference which exists between active immunity and passive immunity. If, in fact, we confer active immunity upon an animal, the immunisation may, in certain cases, last for years, while the prepared antitoxine which one introduces with a view to obtaining passive immunity only lingers for a short time in the system. This difference would not exist if the antitoxine were nothing but toxine transformed, for in that case the mode of production of the immunising substance would be unimportant as regards its action. In active immunity the tissues constantly engender antitoxine in proportion and at the same rate as the latter becomes eliminated. The interesting experiments of Roux and Vaillard

confirm the existence of this incessant production of antitoxine by the cells of the system. In an animal whose blood presented a constant richness in antitoxine, and which was deprived of the greater part of its blood by means of repeated bleedings, these authors found the quantity of antitoxine rapidly reach the former level, a fact which would not have happened if the antitoxine was really derived from toxine, of which the last traces had long ago disappeared from the system of the animal under the repeated bleedings. In favour of the elaboration of antitoxine by the cells of the system one may recall an experiment of Salamonsen and Madsen, who showed that the richness of blood in antitoxine in an animal on which active immunity has been conferred, may be augmented by the influence of substances having the effect of stimulating the secretory functions of the cells,—as, for example, by pilocarpin. Finally, the hypothesis of the production of antitoxine at the expense of toxine is vitiated by the fact that diphtheria antitoxine is found everywhere in the blood of healthy horses, as well as, as Wassermann has stated, in that of subjects which have suffered from diphtheria. Particularly conclusive in this respect are the observations relative to animals; these latter never being attacked by diphtheria spontaneously, there can be no question here of a toxine capable of producing the corresponding antitoxine.

One is therefore led to think that these specific subtances, which are apparently so heterogeneous as regards the organism, are nothing else, in short, than *normal* products of cellular activity. Now, if there is reason for believing that the antitoxines owe their origin to a kind of secretory function of the cells, and are consequently in nowise foreign to the organism, the specific relation uniting them with their toxines only becomes the more strange. But is it not possible even so to find an explanation conformable to the facts already known? To this end it is sufficient to admit that certain cells susceptible of being affected by a toxine contain peculiar elements, endowed with a more or less complete independence, and possessing a strong chemical affinity for the poison in question.

A few years ago M. Ehrlich expressed the hypothesis that the protoplasm of each living cell contains numerous groups of elements of this kind, intended to attract and store up the nutritive substances which circulate in the blood in a low state of concentration. We know, indeed, that many alimentary substances, sugar amongst others, do not occur simply dissolved in the protoplasm of the cell, but are in part so closely incorporated in this latter, that, to free them, a chemical segregation becomes necessary,—as, for example, by mineral acids. M. Ehrlich has given to these hypothetical groups of elements the name of *lateral chains*, borrowing this term from modern chemistry. The lateral chains would thus store up, though accidentally, the toxines of the blood. And so, taking tetanus as an example, it is possible to admit that the nervous cells contain a fixed group of lateral chains, which chance to be endowed with an affinity for the tetanic toxine which they attract with a maximum force. One must suppose that within this lateral chain there is a group of atoms, in which an atomic complexus corresponding to the poison, the *haptophorous group*, adjusts itself with as much exactitude as a key in its lock. Once this adjustment has taken place and the haptophorous group taken firm hold of the cell, the lateral chain, which has acted as intermediary in this process, can no longer perform its habitual functions, that is, attract alimentary substances. It thus finds itself, so to speak, amputated as

regards the physiological functions of the cell, the toxines once fixed remaining attached for a long time to the cell, as experiment shows. Under these conditions, the cell, in order to recover its normal functions, finds itself obliged to create anew the lateral chains, which from the functional point of view no longer exist. Now there is for this kind of regenerative process a general law, established especially by Weigert, according to which, in an occurrence of the kind, it is not a simple compensation, but really a super-compensation, for what has been lost that takes place. Consequently, if these lateral chains of new formation are kept constantly charged with toxine—as actually happens in immunisation for diphtheria and tetanus by means of repeated injections of increasing doses of toxine,—the cell is, so to speak, forced to an exclusive and excessive production of the lateral chains in question. Finally, the number of these chains becomes so considerable that the result is an excess which is prejudicial to the cell, and of which it can rid itself only by restoring to the blood a portion of these newly formed groups, after the manner of a secretory glandular cell. The lateral chains thus set free in the blood are nothing else but what are called antitoxines. In virtue of their very origin, they enclose an atomic group endowed with affinity for the toxine and capable of turning away the latter from the organs which are specially affected by the poison. This opinion, formulated at first as a mere hypothesis, was soon confirmed by the splendid researches of Wassermann on the antitoxic action of the normal nervous system. This author has in fact succeeded in convincing himself that tetanic poison loses its toxic properties when mixed with the triturated cerebral substance of a sound animal. The central nervous system therefore exercises, through the intermediary of the cellular elements which it contains, an action analogous to that of the artificially obtained antitoxine. These facts may be demonstrated in a still neater way by making the experiments in test-tubes, and by making use, not of dead organs reduced to pulp, but of blood corpuscles in full vitality. It may in this way be shown that the corpuscles are capable of fixing quite a series of blood poisons, and that in strictly fixed proportions. It is only after this process of fixation that the destruction of the red globules is effected. Thanks to this interpretation, all the phenomena associated with the production of the antitoxines lose their singular and almost marvellous character. In the very first place, the fact (so odd at first sight) that antitoxines, though not taking their rise from toxines, are yet of specific nature, becomes easily explained, the first condition and cause of all toxic action being a special affinity of the poisons for certain cellular constituents which form lateral chains.

This theory likewise explains the production of antitoxine in relatively considerable quantities in methodical immunisation, just as it tells us why the ulterior incorporations of the poison only increase the elaboration of the antitoxine. It is also easier to understand the difference existing between active immunisation, accompanied by cellular modifications, and passive immunisation, which is effected in the absence of these modifications, as well as the presence of antitoxic substances in the serum of sound animals. Finally, this theory explains the fact that many poisons, especially crystallised and ultra-active alkaloids, do not set up the formation of immunising substances, while poisonous plants, proteid bodies, and the products of bacterial secretion, give rise to the elaboration of antitoxic substances. It has been said that the lateral chains, whose affinity for a

toxic substance is the first condition of the elaboration of antitoxines, are especially organised with a view to the fixation of the nutritive elements of protoplasm. It must be admitted, however paradoxical this supposition may seem, that toxines of complex chemical formation which produce antitoxines are, contrary to alkaloids, absorbed by the cell as if it were a question of simple nutritive absorption. It may seem strange to put these toxines in the same class as alimentary substances properly so called, but the toxicity of the toxines is not due to the same atomic complexus—the lateral chain—which fixes the poison according to the type of the alimentary storage, and to which M. Ehrlich has given the name haptophorous. The toxic properties belong rather to another atomic group, the toxophorous group. The formation of antitoxines would then be absolutely independent of the action of the toxophorous elements. It has been found possible to produce antitoxines by means of poisons so modified that they no longer exercise any hurtful action. In the products thus modified, called toxoids, the group of toxophorous elements is completely destroyed, whilst the haptophorous group, the producer of immunising substances, is there found in all its integrity.

The formation of antitoxins in the organism thus loses the mysterious character which it possessed so long as the immunising substances were considered in the light of principles absolutely heterogeneous to the economy. On the contrary, it must be supposed that processes analogous to the production of antitoxines are constantly going on in the organism, and that the majority of the alimentary substances—that is to say, of the intermediary products of the organic change—cause the formation of new lateral chains, whether in moderate quantity to replace the elements which have ceased to be of use, or in such quantity that the excess is poured into the blood. That being so, the blood encloses in its normal state a great number of substances resulting from the elimination of lateral chains by the cells. There is therefore nothing surprising in the fact that one may (as has been completely established in the last few years), with substances originally non-toxic, or even by means of alimentary substances properly so called, cause reactionary processes absolutely analogous to immunisation from poisons. We owe the first observation of this fact to Belfonti and Carbone, who found that the serum of horses which had been repeatedly injected with blood corpuscles from rabbits acquired totally new properties; this serum —which under normal conditions is in nowise toxic for the rabbit— becomes immediately toxic when employed even in a minimum quantity.

From this we get a general law according to which the blood-serum of one animal species treated by the blood corpuscles of animals of another species becomes very toxic for the latter. The causes of this toxicity have been elucidated by Bordet. This inquirer found that the contact of corpuscles with a heterogeneous serum gives rise to the formation of specific poisons capable of destroying this particular kind of blood corpuscle. We have here a complete parallelism with the phenomena of immunisation by means of living bacteria. If an animal is injected with cholera bacilli there is formed an antitoxine endowed with a special destructive action as regards cholera organisms solely. When blood corpuscles of the rabbit are injected, we obtain a blood-serum capable of destroying the blood of a rabbit, but of no other animal. Similar phenomena have been observed with other cellular elements such as the spermatozoids and the ciliated cells. After injection of ciliated cells into a guinea-pig, we obtain,

according to von Dungern, a serum which destroys ciliated cells. It is possible to evidence analogous phenomena by making use of still more simple non-organised bodies. Thus it is that after having injected an animal with cow's milk, we discover in the blood the presence of substances which curdle cow's milk.

Injections of white of egg produce an antitoxine which coagulates this same albumen.

If the substance utilised contains only a single agent, there is formed a single antitoxine, and we have then a serum which we may call *monovalent.* But an occurrence of this kind does not generally take place when, in order to set up processes of immunisation, we make use of complex materials from the animal organism or living bacteria. These substances contain ferments, poisons, &c. Each of these constituent principles may give rise to an antitoxine, and therefore injection of materials of this kind causes the production not of a monovalent but of a *polyvalent* serum endowed with a certain number of new properties. At the present time we know especially the phenomena which follow on the injection of bacteria. Similarly there may be found in the serum a whole series of bodies, such as the agglutinines, the bacteriolysines, the coagulines, the antitoxines, and the antiferments. These substances differ among themselves, but each of them is endowed with microbicide properties in regard to a definite kind of bacteria. If we use harmless animal cells instead of virulent micro-organisms, we arrive at an analogous process and may in this case confer on the organism, without any inconvenience to it, several new properties. It would be impossible to explain all these phenomena otherwise than by the theory of lateral chains.

However, we here find ourselves face to face with many other problems whose solution necessitates still further researches. It is in fact a question of extracting by means of immunisation the haptophorous groups from the organs in which they are formed, of isolating them, and of studying their properties. These problems once solved, we shall know the laws which govern the formation of each of these groups, and then only shall we be in a position to form an exact idea of the phenomena, still so obscure, of the intra-organic changes. These researches, based on the principle of the possibility of conferring on the organism new and advantageous properties, cannot but prove profitable to medicine, diagnosis, and above all to therapeutics. It behoves us to hope that this principle will soon play an important part in the struggle against disease. Von Dungern has already drawn from it the idea of combating the epithelial neoplasms, especially cancer, by means of an anti-epithelial serum, easily obtained according to the general methods just set forth. As we see, scientific analysis of the action exercised by antitoxines, which at first sight seemed to offer a merely theoretic interest, opens up new horizons to the explanation of vital functions and to rational therapeutics.

(*Annales de Médicine Vétérinaire.*)

Notes.

TRISTEZA.

PROFESSOR LIGNIERES, Director of the Bacteriological Institute at the Palermo Buildings of the Buenos Aires Rural Society, delivered a lecture

before a distinguished audience, which included the President of the Republic and many prominent estancieros, capitalists, medical men, &c., on the cattle disease known as tristeza, which yearly carries off thousands of cattle in the middle and northern provinces.

The learned professor began his lecture with an explanation of his theoretical and practical studies of this disease, which, he said, in other countries is called Texas fever or bovine malaria.

After describing the symptoms of the disease in general, and stating that of 1000 animals attacked over 600 died, he affirmed "that the tristeza microbe develops itself and produces its effects in the blood, destroying the red globules and causing the animal to become anæmic. M. Lignieres announced that he had discovered that tristeza is transmitted to animals by the agency of the garrapata, and in no case by direct contact between animal and animal. The tristeza microbe is transmitted by the garrapata, and it propagates itself in the blood. By this method it produces *Pyroxema bigenimum*, which destroys the red globules to a prodigious extent."

In conclusion the professor assured his audience that, having succeeded in isolating the microbe of tristeza, he hoped, before his departure from the country in March, to prepare a preventive vaccine that would render inoculated animals immune.

In this connection it is interesting to call the attention of our readers to the fact that under date of May 11th, 1897, Mr. Oliver C. James, of Carcarañá, contributed an interesting paper to the columns of the *Southern Cross* on this subject; we reproduce the following sentences from his article, which appeared in our issue of May 15th, 1897:—

"Now that tristeza is fully recognised as identical with Texas fever, as it is called in the States, tick fever as the Australians and the veterinary surgeons of Jamaica term it, bovine tick fever as it is known in New South Wales, we may turn our attention to the disease and its causes.

"It is principally a disease of the blood, for, as it advances, the blood becomes thin and watery, due to the breaking up of the small red corpuscles. These broken particles are absorbed by the spleen and passed out of the system with the urine, to which they communicate a red colour. This blood-coloured urine is regarded as a peculiar symptom of tristeza, but red urine is often due to other causes. Up to the present, scientific investigations point to the presence of a parasitic organism of microscopic character discovered by American investigations, and demonstrated in the blood of diseased animals in Queensland by Messrs. Pound and Hunt, as the direct cause of the destruction of the red corpuscles. These are parasitic upon the corpuscles, and are similar to the organisms found associated in malarial diseases with the red corpuscles of man.

"This parasite has been technically described and furnished with a name—*Pyrosomum bigerinum* (Smith and Killowne, Bulletin I., Bureau Animal Industry, Washington, 1893), and finds a place in the lowest division of animated nature, the *Protozoa*.

"It is naturally transmitted by the cattle tick, or garrapato (*Ixodes bovis*), and by this means alone."

The parallelism of the character of the investigations of the professor and Mr. James. and the identity of their conclusions, is remarkable. The article contributed by Mr. James is a long one, and goes carefully into details, while the professor in his lecture generalises largely, yet so near

is the resemblance that the article might well have been the *precis* of the lecture.

It must be flattering to Mr. James to have his observations and conclusions so emphatically endorsed by a savant of such eminence as Professor Lignieres, because when he first published his views they were, to say the least, regarded by our conservative estancieros as rather fantastic. —*The Southern Cross.*

HORSE SICKNESS AT THE FRONT.

It is a rather remarkable, albeit a very pleasing fact (observes the *Field*) that as yet we have heard little about horse sickness at the seat of war. It is, perhaps, rather early in the season for any great losses from this scourge, March and April being certainly the worst months; but it must already have commenced in Natal, and we shall doubtless hear quite enough about it before many weeks are over. Fortunately, it is only a portion of our forces that is likely to be much exposed to its ravages, for though the disease occurs sporadically over the whole of Southern Africa, and, indeed, has at times assumed the proportion of an epidemic even in Cape Colony, it is in the main confined to parts of Natal, the low-lying districts of the Transvaal, and Rhodesia. The Free State suffers but little, and it is not unusual for the farmers in other parts of the country which are not thus favoured to send their horses thither at the season when the disorder is most prevalent. As the main line of advance of our army is likely to be *via* Bloemfontein, or through Kimberley along the western railway line, it is to be hoped that we may get off comparatively cheaply, though we cannot expect to do so in Natal. Here, and in Zululand, the disease is often excessively fatal, as the 17th Lancers and others who took part in the Zulu campaign have good cause to remember. The extraordinary rapidity with which the paarde-zeikte, as the Boers term it, carries off its victims is most remarkable, and, to the transport or cavalry officer, is one of its most paralysing features. Three or four hours are often quite sufficient; the horse ridden in the morning is dead by sunset. Its wholesale methods, moreover, do not merely decimate, but almost exterminate the camps attacked, and about 98 per cent of the animals affected usually die. We need not dwell here on its symptoms, which are well known to most travellers in South Africa, and have often been described in our columns. What we wish to point out is that, as a scourge which annually causes immense loss to the Colonies, it behoves the authorities to take adequate and scientific means to combat it. As yet absolutely nothing is known about its etiology, and, so far as we are aware, no one has hitherto succeeded in isolating its bacillus. Quite possibly the disorder may not be bacillar at all, but due to an organism allied to that producing malarial fever. In any case, it is manifest that until the cause is known we cannot hope to battle with the disease. The discovery of the hæmatozoon of tsetse-fly disease was a notable feather in the cap of the school of research at Cambridge. Cannot some pathologist from the most progressive of Universities help us in like manner with the paarde-ziekte when peace once more reigns from Cape Town to the Zambesi?

TOBACCO SOAP FOR SCABIES.

Herr Marcruse has been using a soap containing nicotine for the treat-

ment of parasitic skin diseases. The results, so far, have been very encouraging. The soap consists of tobacco extract, 5 per cent.; precipitated sulphur, 5 per cent.; and superfatted soap, 90 per cent. The patient is washed with warm water night and morning, and then anointed with the soap, which is allowed to dry on. This is repeated for three or four successive days, when the cure is complete; then a hot plunge bath is given. It is claimed for the soap that it has no unpleasant odour. In addition to scabies, it has been tried successfully in tinea tonsurans circumscripta, urticaria, and incipient prurigo.—(*Therapeut. Monatschr.* Dec. 1899).

ON THE RELATION OF BLOOD AND LYMPHATIC VESSELS.

Dr. Cecil H. Leaf makes a very important and interesting communication on this subject in the *Lancet* for March 3d, 1900.

In his dissections of the human body he has found numerous communications between the lymph and blood vascular systems, especially in the region of the thorax. He further thinks that there is ground for doubt that the flow is always from the lymphatic vessel into the vein: In one of his instances there was strong reason for supposing that blood passed from the vena azygos minor into the thoracic duct. The pathological importance of such intercommunications is of very considerable importance. "If communications between the veins and lymphatics can be shown beyond doubt to take place all over the body—and already they have been observed to exist to a very considerable extent—it follows that we ought to regard the venous system as part, and that no inconsiderable part, of the absorbent system. We shall then have a ready explanation of certain facts usually regarded as peculiarities in connection with dissemination of the sarcomata and carcinomata.

"It is a fact that some of the carcinomata, though affecting the lymphatic glands to a slight extent only, yet disseminate rapidly; in such cases it seems hard to believe that the cells have had to traverse innumerable chains of lymphatic glands, which, as all admit, act as most efficient barriers, before they could pass into the general circulation."

WOUND OF THE METACARPO-PHALANGEAL ARTICULATION.

Most veterinary surgeons, we imagine, when called in to advise respecting the line of treatment to be adopted in extensive wounding of the metacarpo-phalangeal articulation, would pronounce a very grave prognosis, and would most likely suggest that the best treatment was such as the horse-slaughterer might be capable of conducting. That all such cases are not to be condemned is shown by a case recorded by M. E. Mark (*Recueil de Médicine Vétérinaire*), who was called in to treat a case in a year-old foal, which, while gambolling about in a courtyard, succeeded in inflicting a deep wound over his fetlock, opening the joint, and completely severing the tendon of the extensor communis digitorum (extensor pedis). The wound was 10 centimetres (4 inches) in length, and passed obliquely downwards and outwards. In addition to the skin wound, the first phalanx was involved, and the joint opened for at least 4 centimetres (1½ inches). M. Mark treated the case by washing it carefully with corrosive sublimate solution, joining the cut ends of the tendon, and completely suturing the external wound. Antiseptic solution was applied three times a day. The result was a complete cure in forty-five days,—a result that should en-

courage practitioners to endeavour to save similar cases by antiseptic means, and refrain, as far as possible, from advocating immediate slaughter where there seems even a remote chance of successful treatment.

THE DANGERS OF SULPHUR AS A PURGATIVE.

The practice of giving sulphur to any dog which is or is thought to be out of sorts appears to be as common among the laity of France as it is in this country. That this practice is not unattended with risk is shown by a case reported by M. Hébrant (*Annales de Médicine Vétérinaire*). A dog three years old was judged by its owner to be less energetic than usual. A dose of sulphur was given by way of purgative in the morning. By four o'clock in the afternoon the animal had colicky pains, purgation, and vomition. In the evening matters were worse; respiration was rapid, and the animal became comatose. Afterwards there was vomiting of liquid, blood-stained material. However, when the dog was brought to M. Hébrant on the following morning, the symptoms were less severe. Purgation had ceased, but there was vomiting from time to time of small quantities of red blood. The pupils were slightly dilated, pulse 98, and the mucous membrane pale. Treatment consisted in the administration of carbonate of iron to neutralise any sulphuretted hydrogen which might be in the alimentary canal, a little nux vomica, and demulcent drinks. Cure resulted very rapidly.

Naturally M. Hébrant wishes to protest against the indiscriminate use of sulphur among domesticated animals.

THE NATIONAL VETERINARY ASSOCIATION.

The following is a list of papers to be read at the Dublin Meeting in August next :—

Telegony and Cross Breeding—By Professor EWART, Edinburgh. Discussion opened by Mr. W. PALLIN, Curragh, Co. Kildare.

Veterinary Surgical and Mechanical Appliances—By Mr. JAS. M'KENNY, Dublin. Discussion opened by Mr. SIDNEY VILLAR, Harrow.

Veterinary Hospital Nursing of Medical Cases—By Mr. W. BYRNE, Roscommon. Discussion opened by Professor DEWAR, Edinburgh.

Veterinary Hospital Nursing of Surgical Cases—By Mr. P. J. HOWARD, Ennis. Discussion opened by Professor MACQUEEN, London.

Parasitic Diseases communicable to Man from Animals—

By Food—By Mr. F. C. MASON, Blackrock, Dublin. Discussion opened by Principal M'CALL, Glasgow.

By Contact—By E. WALLIS HOARE, Cork. Discussion opened by Principal M'CALL, Glasgow.

From the names of those who are to take a leading part in the proceedings, we feel fully justified in predicting that this year's meeting will be one of the most successful in the Association's annals. If it were necessary to hold out any further attraction, those who are responsible for the arrangements have done so by fixing the meeting for the week before the Dublin Horse Show; so that any one attending the Association's meeting may also be in a position to visit one of the most attractive of all gatherings of horses. Messrs. Cook and Co. are being approached with a view to providing travelling and hotel accommodation. As a still further inducement, a three days' trip to Killarney is being arranged for.

Reviews.

THE MANAGEMENT AND DISEASES OF THE DOG. By JOHN WOODROFFE HILL, F.R.C.V.S. 5th Edition. 10s. 6d. London: Swan, Sonnenschein & Co.

When any book has reached its fifth edition it has passed far beyond the condition in which serious criticism is needed. The fact that four editions have already been exhausted, each in an average of little over five years, shows that the work has met with acceptance at the hands of the public. Mr. Woodroffe Hill's book has been written apparently as much for the lay as for the professional public, and this, no doubt, in a measure accounts for the multiplied editions. The present edition has been altered chiefly by the addition of photographs of representatives of various breeds of dogs. These photographs are from the camera of Mr. Fall, of Baker Street, W., and for them we have nothing but praise. Mr. Fall has the happy knack of catching his canine sitter at the right psychological moment, so to speak, with the result that his pictures are speaking representations of the various breed peculiarities.

Mr. Hill has removed the text of the law regarding the muzzling of dogs, and satisfies himself with stating his views on the subject in his preface. He sums up his opinion as follows: "Utterly ineffectual in stamping out rabies; partial and aggravating in its administration; injurious and cruel to the subject. Apostles of humanity, usually termed by the opposite sect sentimentalists, will probably agree with the author's verdict, but otherwise I am ready at any time to defend it on the broad grounds of common sense and long practical experience as a canine pathologist—apart from which I recognise animal rights. Why compel dogs to be muzzled or confined in durance vile, and why not rather compel them to take regular healthful exercise unfettered by muzzle, and with a proper regard to general hygiene?" Each practitioner will come to his own conclusion as to whether the writer takes the right or the wrong view of the subject.

The appendix will be valuable to those who are interested in breeding or showing dogs, as it contains a synopsis of the standard of points for judging dogs of various breeds.

PHARMACIE ET TOXICOLOGIE VETERINAIRES. Par A. F. Deland et O. Stourbe. 1 vol. in 18 jésus, cartonné. 5 fr. Paris: J. B. Baillière et Fils.

It is only a few weeks since we noticed the appearance of a member of the admirable *Encyclopédie Vétérinaire*, so ably edited by Professor Cadèac. The present volume is the latest addition to the series. It ably maintains the reputation of the previous publications both in its thoroughness,—consistent with size,—and its lucidness of expression.

It is divided into two sections: Veterinary Pharmacy, by M. Deland; and Veterinary Toxicology, by M. Stourbe. The section on pharmacy contains an account of preparations, actions, and doses, as in the ordinary works on the same subject, combined with much good advice and many hints to the practical pharmacist. We learn from this section the composition of the "*liqueur de Van Swieten*," so much used by French practitioners,

and so frequently mentioned in the records of cases found in the French periodicals. The following is the formula :—

"℞ Bichloride of mercury, - 1 gramme.
Distilled water, - - 900 grammes.
Alcohol, - - - 100 „

Dissolve the bichloride of mercury in the alcohol, and add the water. In order to obtain a solution that will remain clear, and of standard strength, it is better to dissolve the corrosive sublimate in 1 gramme of hydrochloric acid and then add the water."

M. Stourbe in the section on toxicology discusses the various poisons, their channels of absorption, their toxic doses, the symptoms they produce, the suitable treatment, and the tests for their detection.

The more we see of this Cyclopædia, the more we regret that we have not something similar in the English language. That the English-speaking veterinarians could produce an equally good veterinary library we see no reason to doubt. All that seems necessary is that some one should take it up energetically, and that there should be a hearty co-operation ; and we feel sure it would not be long before we were called upon to review the first volume. The value of such a cyclopædia cannot be over-estimated. By means of it we have to our hand works on special subjects written by those most fitted to speak and most likely to be accorded a respectful hearing. The subject is well worthy the careful consideration of our leading men.

THE PIG : ITS EXTERNAL AND INTERNAL ORGANISATION. Revised and Edited by Sir G. T. Brown, C.B. 3s. 6d. nett. London. George Philip & Son.

Messrs. Philip have added yet another to the series of scientific picture books dealing with the anatomy of our domesticated animals. The scope and get-up of the work is strictly comparable with those attributes of its predecessors. We might add further, that its good qualities are neither better nor worse than those of the works which have already appeared.

It is somewhat difficult to seriously criticise this production in a periodical devoted to professional matters, and for this reason, "The Pig" is obviously written for lay, not for professional readers ; and it has been the obvious endeavour of the compiler to produce a book which shall contain as few technicalities as possible. While freely admitting the extreme difficulty of describing technical subjects and explaining scientific processes in language such that the man in the street may understand, we do not think that the present series is up to the standard which might reasonably be expected. Some of the letterpress is pithy and good, some vague, some ambiguous, and some decidedly misleading.

In the present member of the series, for example, we find the following : "The single (muscular) fibres are virtually little tubes filled with an albuminous fluid. After death the contents are drained off, causing the tubes to shrink. The stiffness of death (*rigor mortis*) is attributed to this." It may be our ignorance, but this is to us a new theory of the cause of *rigor mortis*.

"The lymph is a highly nutritive fluid, not unlike milk, which on the one hand has the function of conveying new preparative material to the blood." This may be all right, but it seems, to us at least, rather vague

and unsatisfying. Again, what are we to make of the following? "Before the rays of light, however, can reach the retina, they must pass through various refracting media, *i.e.*, the *aqueous humor*, the *crystalline lens*, and the *vitreous humor*. These refract the light in such a manner that the scattered rays may unite into a picture straight on the retina. Between the anterior and the iris, stretching across the eye from its rim, and across the lens, a space remains, which is called the cornea chamber; while the posterior one lies between the hinder wall of the iris and the lens. Both chambers would be connected if the rim of the iris were not firmly and closely placed on the lens."

One more example of vague statement and we have done. "Auricular perceptions are produced by the agency of the internally disturbed auricular nerves."

It appears, to us at any rate, as if the compiler were some one lacking in scientific knowledge; and it is universally admitted that a popular work, to be clear, must be written by one possessing the fullest possible knowledge of the subject.

The great fault appears to consist in an attempt to cover too much ground in the limited space available in such a production. We cannot think but that the result would have been better if the effort had been just a little less ambitious. All the same our best thanks are due to the publishers for their very praiseworthy endeavour to bring a knowledge of the structure of the domestic animals within the reach of the general public.

For the third time we would enter our protest against the use of such flimsy material for the folding plates, which constitute, in our estimation, much the most valuable part of the book. We have previously suggested that Messrs. Philip would be consulting their own interests in using some more durable fabric, and we again repeat the suggestion. Apart from this defect, the general get-up is all that could be expected, and this will be all the more freely admitted when the extremely moderate price is taken into account.

ELEMENTOS DE MICROBIOLOGIA pora uso de los Estudiantes de Medecina y Veterinaria. Par Luis del Río y de Lora. Madrid. Librarían International de Romo y Fussel.

Up to recently, the Spanish student of bacteriology has had to depend upon foreign text-books, or translations of them. Now, however, thanks to the industry of Dr. L. del Río, Spain can boast of a manual of her own. The work at present before us is arranged in the same manner as the best Continental text-books; it contains the usual chapters on technique, biology of micro-organisms, &c., and there can be little doubt that it will at once attain to the proud eminence of being the standard work of reference for Spanish medical and veterinary students. Our pampered British taste is, of course, offended by the poor quality of the paper, but this does not remove any excellence from the subject-matter; and further, on the Continent it is not so customary to use good paper for text-books as it is with us. Therefore the mere get-up of the book may be taken as a negligible quantity. Dr. del Río has earned the gratitude of his scientific *confréres* by removing from Spain the reproach that she was behind the other nations in the matter of bacteriological literature.

LE CHEVAL ANGLO-NORMAND. Par Alfred Gallier. Paris. Baillière et Fils.

We have no district in Britain which can be compared, from a horse-breeding point of view, with the plain of Caen in France. There the breeding and rearing of horses is reduced to a fine art, and the product—the Anglo-Norman horse—is famous all the world over. "The plain of Caen may, without contradiction, be considered the district where the production of horses is of most importance, not only because of the number, but also because of the quality of the product. Justifying the title of the 'Stud of France,' . . . for more than fifty years . . . it has supplied all needs."

It is with this "Stud of France" that M. Gallier concerns himself in the volume at present before us. The necessity for some such *Haras* became manifest in the reign of Louis XIII. In 1639 a royal edict was issued organising the *Haras de l'Etat*, but it was not until twenty-six years later, in 1665, that Colbert caused the State to interfere in a permanent and regular manner in the breeding of horses. From this date up to within the last fifty years the stud suffered many vicissitudes. At the present time, however, its importance cannot be over-estimated. Not a little of this importance, we are pleased to note, is due to the importation of English sires. This importation began with *Highflyer* in 1808. From 1816 English sires have been more constantly introduced, until at the end of the century the list has become very lengthy. Among others, we notice the names of *Tigris*, *Jagger*, *Topper*, *Rattler*, *Eastham*, and *Pretender*. Since 1840 the English trotter has been introduced, with the result that the Anglo-Norman horse has been definitely produced.

M. Gallier very ably follows the fortunes of the stud from its precarious beginnings to its certain establishment to-day. He considers that it should be more consistently supported and regulated by the State, and he contends that the disparaging remarks that have been made about it from time to time are unjustified.

Any one interested in the scientific breeding of horses, either for army, racing, or agricultural purposes, couldn't do better than procure and study M. Gallier's book. It is freely illustrated, and contains full genealogical tables. It shows abundant evidence of painstaking and laborious work, and we do not doubt that, in France at least, it will meet with the praise and popularity which is its rightful due.

THE PHYSICIAN AND SURGEON. Illustrated. A Weekly Review of the Medical World. London. Cranville House, Arundel Street, W.C.

Medical periodical literature has been very considerably enriched by the entrance into its ranks of a new illustrated weekly. *The Physician and Surgeon* strikes an entirely novel note in the medical press. It obviously aims at presenting a fare of less than the usual heaviness, yet not too light to be taken seriously, and withal seasoned by a rich sprinkling of good illustrations. Indeed the illustrations are the most outstanding feature in the new venture. We are very pleased to extend a hand of welcome to our young contemporary, more especially because a new link is welded joining the medical and veterinary professions. This link, we may explain, consists of articles on Comparative Medicine, a sample of which we are pleased to give in our present issue in the shape of a protest against the gross neglect of the Army Veterinary Department by the people in authority. We wish our new friend a hearty welcome and an extensive circulation.

THE VETERINARY MUTUAL BENEVOLENT FUND—FINANCIAL STATEMENT DEC. 31st, 1899.

Dr. Mr. EDWIN FAULKNER, Honorary Treasurer, in account with the Fund. *Cr.*

RECEIPTS.

1899,		£	s.	d.
Jan. 1.	To Cash at Bankers, . .	258	18	9
Dec. 31.	To Mersey Docks and Harbour Board, one year's Interest on Bond for £1300 at 4 per cent., less tax, . .	50	5	4
	,, Mersey Docks and Harbour Board, one year's interest on Bond for £600 at 3½ per cent., less tax, . .	18	2	6
	,, Manchester Corporation Improvement Department, one year's Interest on Mortgage for £900 at 3 per cent., less tax, ...	26	2	0
	,, Corporation of Salford Gas Department, one year's Interest on Loan of £600 at 2⅝ per cent., less tax, .	15	4	6
	,, Bank Interest, . . .	5	5	0
	,, Balance due to Treasurer, .	2	0	0
		£375	18	1

PAYMENTS.

1899,		£	s.	d.
Dec. 31.	By Grants and Donations:—			
	K. C. . £11 0 0			
	A. L. G. . 30 0 0			
	J. R. . 5 0 0			
	D. G. H. . 10 0 0			
	J. D. R. . 5 0 0			
	R. B. . 5 0 0			
	C. B. . 10 0 0			
		76	0	0
	,, Cash at Bankers, . .	299	18	1
		£375	18	1

THE VETERINARY MUTUAL DEFENCE FUND—FINANCIAL STATEMENT DEC. 31st, 1899.

Dr. Mr. EDWIN FAULKNER, Honorary Treasurer, Knott Mill, Manchester, in account with the Fund. *Cr.*

RECEIPTS.

1899,		£	s.	d.
Jan. 1.	To Balance at Bankers, . .	569	19	9
Dec. 31.	,, Subscriptions received 1899, as per List, . . .	140	15	0
	,, Bank Interest, . . .	11	12	9
	,, "The Hewson Appeal Fund," surplus balance returned, . . .	2	12	0
	,, Balance due to Treasurer, .	4	6	8
		£729	6	2

PAYMENTS.

1899,		£	s.	d.
Jan. 1.	By Balance due to Treasurer,	3	11	11½
Dec. 31.	,, Hire of Rooms, . .	0	10	0
	,, Stationery, . . .	7	5	6
	,, Solicitor's Costs, . .	5	1	4
	,, Secretary's Postages and Expenses, ...	1	4	0
	,, Treasurer's do. do.	0	5	7½
	,, Cheque Book, . . .	0	1	8
	,, "The Hewson Defence Fund," Donation per H. Thompson, . . .	10	10	0
	,, Butcher, Litton, and Pownall, Accountancy Charges,	4	10	6
	,, Balance at Bankers, .	696	5	7
		£729	6	2

We have examined the above-written Account, and certify the same to be correct.

20th January 1900.

ALFRED H. POWNALL, F.C.A.
JNO. B. WOLSTENHOLME.

INVESTMENTS.

Mersey Docks and Harbour Board—4 per cent. Bond No. 71,621, dated July 2d, 1880; repayable 1st July 1900, ...	£1300 0 0
Mersey Docks and Harbour Board—3½ per cent. Bond No. 77,534, dated March 6th, 1883; repayable 27th March 1911, ...	600 0 0
Manchester Corporation Improvement Department—3 per cent. Mortgage No. 460, dated October 2d, 1890; repayable 29th September 1900, ...	900 0 0
Salford Corporation Gas Fund—2⅝ per cent. Mortgage Bond No. 2233, dated January 13th, 1897; repayable 13th January 1900, ...	600 0 0
	£3400 0 0

We have examined the above-written Account, and certify the same to be correct.

20th January 1900.

ALFRED H. POWNALL, F.C.A.
JNO. B. WOLSTENHOLME.

SAM. LOCKE, *Hon. Sec.*

CONTAGIOUS DISEASES ANIMALS ACTS, 1864 AND 1899.

SUMMARY OF RETURNS OF OUTBREAKS for the Five Weeks ending 17th March 1900.

ENGLAND AND WALES.

Foot and Mouth Disease.	Swine Fever.	Glanders (including Farcy).	Rabies.	Anthrax.	Sheep-Scab (for month of February).
Outbreaks 2 Attacked 36	Outbreaks 153 Slaughtered 1800	Outbreaks 100 Attacked 198	None.	Outbreaks 45 Attacked 67	Outbreaks 296

SCOTLAND.

None.	Outbreaks 1 Slaughtered 32	Outbreaks 4 Attacked 13	None.	Outbreaks 19 Attacked 25	Outbreaks 12

IRELAND.

None.	Outbreaks 13 Slaughtered 370	Outbreaks 4 Attacked 5	Dogs 1 Other Animals 0 Destroyed 0	None.	Outbreaks 59

Communications, Books, Journals, &c., Received.

Veterinarian; Record; Bulletin of The John Hopkins Hospital; The Journal of Comparative Medicine and Veterinary Archives; The Scottish Medical and Surgical Journal; American Veterinary Review: The Public Health Journal; The Journal of the Jamaica Agricultural Society; Queensland Agricultural Gazette; Petersburg Veterinary Society's Journal; La Riforma Veterinaria (Naples); Recueil de Médecine Vétérinaire (Alfort); L'Echo Vétérinaire (Liège); Annales de Médecine Vétérinaire (Brussels); Berliner Thierärztliche Wochenschrift (Berlin); Deutsche Thierärtzliche Wohenschrift (Hannover and Karlsruhe); La Clinica Veterinaria (Milan); La Revista Veterinaria (Buenos Aires); Agricultural Journal (Cape Town); Bulletin de la Société des Sciences (Bucarest).

Deland & Stourbe's Pharmacie et Toxicologie; Gallièr's Le Cheval Anglo-Normand; Physician and Surgeon; Wellington Journal and Shrewsbury News; The Pig: Its External and Internal Organisation; Woodroffe Hill's The Dog; Gazette Médicale de Paris; Practical Horse-Shoeing (Fleming); Among Horses in South Africa (Hayes); Le Mois Scientifique (Paris); Rev. F. Lawrence, Kirkham Abbey; Oliver C. James, Carcaraña; J. Connochie, Ayton; J. Macphail, Edinburgh; P. Moir, Edinburgh; Hy. Locke, Manchester; Sam Locke, Manchester; J. Malcolm, Birmingham; H. S. Elphick, Newcastle; W. R. Davis, Swansea; Spratt's Patent, Limited; F. Torrance, Winnipeg.